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SWITCHING ON THE GREEN ECONOMY

IN-DEPTH ASSESMENT OF AGRI-FOOD AND BEVERAGE SECTOR

ULAANBAATAR, 2022

An in-depth assessment of the Agri-food and beverage sector was developed by Business Meridian Consulting LLC funded by the Development Solution NGO.

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ABBREVIATIONS

CCO	Collective Certification Organization
CE	Circular economy
GAP	Good Agricultural Practices
GDP	Gross domestic products
LLC	Limited liability company
MNCCI	The Mongolian National Chamber of Commerce and Industry
MNT	Mongolian tugrik
MoFALI	The Ministry of Food, Agriculture and Light Industry
MSME	Micro, small and medium enterprises
NEAA	Netherlands Environmental Assessment Agency
NGO	Non-government organization
R&D	Research and development
SAQ	Self-assessment questionnaire
JSC	Joint stock company

GLOSSARY

Glossary	Description
Green certification	A certificate confirming that activities are carried out following the principles, standards and regulations of being green or environmentally friendly
Value chain	A concept that defines the chain of business activities in the creation of products and services
Bottle neck analysis	Analysis to identify problems and obstacles in the operation
Circular maturity level	An evaluation model that describes the activities and characteristics of implementing circular economy practices or becoming circular
Circular economy	It is a production and consumption model that involves sharing, renting, reusing, repairing, renewing and recycling inventory and products for as long as possible.
Circular practices gap	Gaps between international good practice and the current situation in the circular economy
Circular economy practices	Good practices in manufacturing and consumption involving sharing, renting, reusing, repairing, refurbishing and recycling inventory and products as long as possible
Cause effect scheme	Tools used to determine the cause and effect of a problem
Eco-labelling	The process of obtaining marks and symbols to ensure that operations are carried out by green or environmentally friendly principles, standards and regulations

TABLE OF CONTENTS

LIST OF IMAGES

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Mongolia's Agriculture and Food sector contributes 13% of the GDP and 30% of its employment, but greenhouse gasses and waste emissions from the same sector have a significant negative impact on the environment. The Ministry of Food, Agriculture, and Light Industry (MoFALI) is aiming to label and certify five percent of all agricultural food products by 2030. As part of the sustainable development agenda, it is essential to support micro, small and medium enterprises (MSMEs) to adopt the best practices associated with the circular economy (CE) to reduce the negative impacts of the sector on the environment as well as to achieve the above objectives.

A project that is being implemented as part of the European Union's Switch Asia program, **"Switching on the Green Economy"**, is dedicated to the reduction of carbon emissions, the transition to a resource-efficient circular economy, and the reduction of poverty in Mongolia. People in Need, Caritas Czech Republic INGO, the Mongolian Sustainable Financing Association, and Development Solutions NGO are jointly implementing the project. The project will continue for the next four years in Ulaanbaatar, Erdenet city and Selenge provinces.

In the context of this project, MSMEs in Mongolia's Agri-food and beverage sectors will be provided with the information and methods necessary to change their practices and behaviors. This will provide the opportunity for the introduction of market-based eco-labels, sources of green financing, as well as support for the transition to the CE. Several outcomes will result from the implementation of this project, including the development of a common eco-labelling standard for MSMEs and retail service providers, the development of a new online platform for eco-labelling, and the integration of the eco-labelling process with digital financial tools.

Around one-third of the food produced for human consumption (about 1.3 billion tons per year),[1] is being wasted worldwide, whereas on the other hand about 1 billion people[2] suffer from hunger. Food networks are important not only for social and ethical issues but also for environmental protection. It has long been known that food production, distribution, and storage consume a significant number of natural resources. Yet food waste continues to contribute to climate change in numerous ways (food waste alone is responsible for about 8% of greenhouse gas emissions). Thus, the issue of food waste management is a critical issue that needs to be taken into consideration from any aspect of the social, environmental, or economic realm. According to the European Environment Agency, the main sources of food waste are households at 42%, food processing and manufacturing enterprises at 39%, hotels, and restaurants at 14%, and finally wholesalers and retailers, grocery stores, supermarkets, and large stores at 5%.[3]

[1] Food waste refers to the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers (SOFA, 2019).
[2] http://www.fao.org/food-loss-and-food-waste/en/
[3] https://www.eea.europa.eu/media/infographics/wasting-food-1

On the 28th of April 2022, Business Meridian Consulting LLC agreed with Development Solutions NGO, to conduct an in-depth assessment within the framework of the project **"Switching on the Green Economy".** The purpose of this in-depth assessment is to provide necessary information to the parties involved in the implementation of the project.

The research work in Ulaanbaatar and Erdenet city and Selenge, and Umnugovi provinces consists of the following five main parts: (i) current situation of the Agri-food and beverage sector, (ii) potential of the sector, (iii) circular economy practices, (iv) value chain, (v) International CE best practices. The assessment has identified sub-sectors with higher priority and the most significant value chains and developed structured guidance and recommendations according to the results of the assessment.

Current situation of the Agri-food and beverage sector

As part of a research project, the current state of the agri-food and beverage sector has been analyzed in detail within the sub-sectors of agriculture, beekeeping, food and beverage production, and retail trade services. In Mongolia, grain constitutes the majority of the agricultural sector, and flour and baked goods account for 63% of the daily food consumption of the population[4], so it is likely that the value chain for this line of products has been developed to a higher level, and has achieved a competitive advantage than other subsectors. Potatoes, vegetables, delicate vegetables, and fruits represent less than 10% of the country's cultivated area[5], and their competitiveness is weak due to the lack of processing plants, farmers, and low prices of similar imported products. According to the country's agricultural statistics, Selenge province, where the project is to be implemented, is responsible for 33% of the country's agricultural production, while Ulaanbaatar, Erdenet, and Umnogovi provinces are responsible for a very small share.

An in-depth assessment was carried out through 742 MSMEs and retail service providers and 16 business associates. According to the MSMEs, there are limited opportunities and governmental support in terms of funding in the sector, and they have also mentioned that low-interest, long-term loan financing is necessary to help them succeed, as well as government support and incentives would be very beneficial. In conclusion, the need to increase the availability of professional human resources is something that the industry has not been able to address in the past, and for this reason, knowledge-based training and coaching are needed for the potential workforce.

The capacity of the Agri-food and beverage sector

There have been several changes made in our country to ensure the safety and quality of food and drink, including the introduction of "Organic Food Certification Label", "Good Agricultural Practices" and international standards for food safety and environmental safety to guarantee the

[4] https://mofa.gov.mn/exp/blog/10/82
[5] 1212.mn

conditions and safety of agricultural primary production. However, there are only a few organizations that meet these standards and verify their compliance with these standards. A comparison of the certification process for the Organic Product Eco-label issued to non-food products by the Mongolian National Chamber of Commerce and Industry (MNCCI) and the Organic Food Certification Label issued by the MoFALI shows that the Organic Product Eco-label requires fewer steps, takes less time and costs less. The joint certification process of the Organic Food Certification Label requires a period of one year for the preparatory stage followed by a period of one year for implementing the requirements, so MSMEs must be committed to the process and patient in implementing it. Furthermore, the experts agree that the low percentage of producers who take part in certification is related to their knowledge and skill. To the survey designed to determine the concept and attitude toward eco-labelling, the majority of MSMEs have a smattering of knowledge about eco-labelling, while 18% have never heard of eco-labelling. However, all agreed that eco-labelling can increase product and service reliability and have a positive impact on buying decisions.

A review of the organization's needs in terms of training and funding, as well as how the organization has been able to provide for its employees, was also undertaken in this section. Beekeepers are among the enterprises having the highest rates of regular training on waste collection, sorting, and recycling systems, as well as cooperation with other enterprises in obtaining training and consulting services, as well as the highest rate of cooperation with other enterprises, followed by manufacturers of food, water, and beverages.

It has been indicated by the participants that for them to accomplish their goals, they need additional funding ranging from MNT 11-50 million. The main problems they identified about financing are a limited number of financing sources, difficulty obtaining collateral for a loan, and interest rate, which are more or less related to the Mongolian financial sector regulations. Meanwhile, MSMEs need to improve their skills in terms of writing project proposals.

Self-assessment of the respondents revealed that they have a positive view of their organization's image and organizational culture, whereas they consider technology to be their weakest area. It is therefore important to note that, in the case of future ecolabelling processes being organized online, the development of the digital skills of participants will also require training and awareness activities.

Circular Economy Practices

A study has been carried out to examine how the concept of circular economy (CE) applies to everyday operations of MSMEs, to establish the current state of the CE and to identify any discrepancies that might be present. Toward this end, it was assessed whether business organizations and individuals incorporate the concept of the circular economy into their strategic goals and internal organizational structure, whether they have implemented them and whether they have adopted the simplest eco-practices that are safe for the environment as part of their daily operations.

Considering the CE as a multidimensional concept of the environment, society, and the economy, it encompasses a wide range of goals, such as reducing the consumption of resources, optimizing the main process of activity, extending the life of end products, and reusing and recycling. In this sense, the implementation of best practices for a CE varies according to the sector in which the practice is applied. Several factors were considered when evaluating the implementation of best practices, including (1) the overall strategic plan, the level of integration with national standards and projects, the level of indicators that were used to measure the CE goals and (2) the degree of integrating CE practices into everyday operation. Below are some of the important results we have noted in this regard.

- The MSMEs tend to comply better with general rules or regulations directly related to the sub-sector in which they.
- In the case of beekeepers and farmers, they develop projects and plans to evolve and implement environmental and economic efficiency operations in order to keep up with financial requirements, industry growth and future trends.
- In comparison to other entities in the subsector, food and beverage producers, as well as retailers have a relatively higher level of compliance with five widely used national standards: The certified organic eco-label of MNCCI, Organic food certificate of the MoFALI, MNS 6737:2018 Good Agricultural Practices, ISO 22000 Food safety management system and ISO 14001 Environmental Management system.
- The experience of compliance with the standards implemented in Mongolia is the weakest in the case of retailers, and there is no plan to develop and implement environmentally friendly activities.
- It should be noted that none of the four sub-sectors above introduce CE implementation objectives and key measurement indicators.

An overview of how the seven R principles of CE, namely, Reject, Redesign/Rethink, Reduce, Reuse, Repair, Remanufacture, and Recycle, are implemented in sub-sectors is presented. There is a tendency for organizations to put a great deal of emphasis on procurement activities of the organization, including costs, raw materials, making high demands on suppliers, and refusing to accept unnecessary or unprofitable products. Further, the maintenance and internal cleanliness on regularly at an appropriate level are satisfactory. Practices to reduce the use of resources in the production process are implemented to some extent. The technological ability to reduce negative impacts on the market, environmental safety, and society is weak and there is an insufficient experience in redesigning and rethinking products. In addition, the experience of reusing any material for different purposes and remanufacturing is at an insufficient level for the sector.

Value chain

The value chain analysis has been carried out in sub-sectors, to identify inputs operations and outputs of production to map the value chain. The geographical location of sub-sectors and bottlenecks analysis is defined. In an in-depth study of the competitive situation of the Agri-food and beverage sector, the variety of products is few, domestic products are not competitive,

enterprises have poor technical equipment, have low adherence to standards, are less flexible in adapting to the needs of their customers, they do not have their distribution channels, mostly supply to wholesalers, production volume is low and the lack of opportunities for the economies of scale. Therefore, the level of competition is at the primary stage. The current competitiveness of SMEs limits their ability to expand their activities, expand their markets and further adopt circular economy practices in the future.

There are obstacles throughout the value chain, including unrecognized on the market, consumers are eager to purchase domestic products, but the products and services do not meet their requirements fully, limited product sales channels, and the inability to establish long-term effective relationships in operations and waste resulting from logistics problems. Although our country has a vast territory, transportation possibilities are limited.

International best practices

It is intended to define the principles of CE, which may be easily implemented by our nation. Several examples of 55 different SMEs in 15 Asian and European countries were studied, as well as government policies, best practices and activities implemented by 10 countries that are world leaders in CE. International CE strategies demonstrate that instead of presenting the entire CE to society, they develop specific programs and focus on a single issue in the long term. In Sweden, China, Japan and Korea, for example, specific measures have been implemented based on the capabilities of their business organizations. The most common form of best practice and examples of business organizations seem to be based on waste reduction and recycling.

In the process of self-assessment, the MSMEs of the Agri-food and beverage sector were evaluated based on seven criteria factors: CE experience, policy implementation, environmental protection knowledge, eco-labelling, organizational capacity and training requirements. As a result, the sub-sector of food and beverage production, which received the highest rating based on the weighted average rating, is identified as a priority sub-sector for development. Moreover, a second sub-sector is the Retailers, a third is Beekeeping, and a fourth is the agricultural sub-sector.

A Circular Maturity Model was used to assess the implementation of the CE in the above-mentioned subsectors and to develop recommendations for training and consulting services. According to our analysis, the retail sub-sector is at zero maturity, the agricultural sector is at level I, and the subsectors of food and beverage production and beekeeping are partially at level II. Consequently, it is deemed necessary to implement the project differently based on the level at which it has reached.

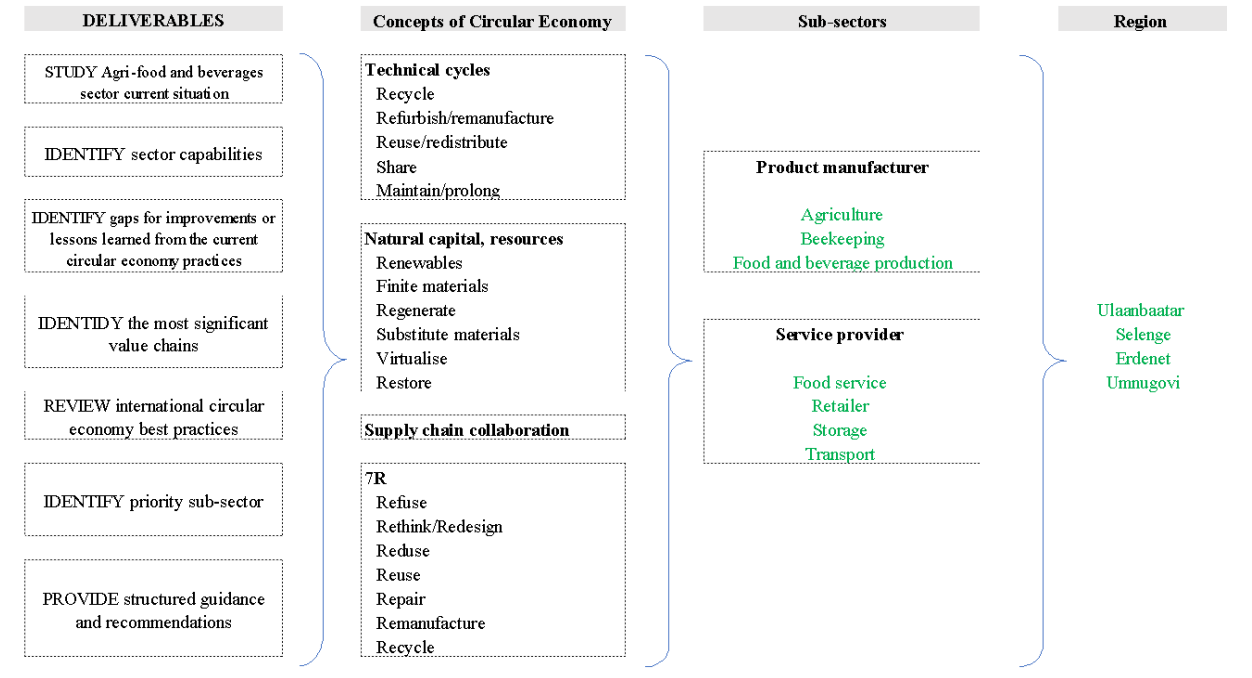
Lastly, the recommendations were developed in five areas: reducing greenhouse gasses, developing cooperation between small and medium-sized enterprises, implementing training and consulting services optimally, issuing green certifications, increasing public awareness and promoting the program.

1. METHODOLOGY

1.1. Assessment framework and deliverables

A comprehensive analysis and evaluation of the micro, small and medium enterprises (MSMEs) in the regions of Ulaanbaatar, Erdenet, Selenge, and Umnogovi provinces is conducted to determine the situation, potential, environment-friendly business attitudes and implementation of the CE. A five-area analysis is conducted in the research and analysis work: (i) the current situation of the Agri-food and beverage sector, (ii) the potential of the sector, (iii) CE practices, (iv) the value chain, (v) international CE best practices, and the results are illustrated in the figure below. Study findings defining Mongolia's agriculture sector were compared with international best practices, and subsectors for priority development, the most significant value chains have been identified, and structured guidance and recommendations were developed.

Figure 1. Research framework



In the study, the keywords, circular economy and eco-labelling were selected and scientific achievements, trends, best practices and research activities of the leading countries in feasibility studies were identified based on secondary data. International best practices are presented in the international best practices of CE section (Chapter 6) in addition to being used in self-assessment methodology. The activities and government policies of 10 countries with the highest level of research and leading CE practices and 55 different small and medium-sized organizations from 15 countries in Asia and Europe were studied.

1.2. Self-assessment questionnaire

1.2.1. Design of the survey

The survey intended to (i) identify the current level of understanding of the Argi-food and beverage sector MSMEs, business associations and retailers on eco-labelling, and capacity to introduce circular economy practices (energy, water, and resource-efficient practices, use of transport, use of packaging, food waste, etc.); (ii) quantify the overall market financing needs and barriers of MSMEs; (iii) identify gaps for improvements; (iv) map out the current geographical and sectoral distribution of MSMEs within the project area; (v) identify priority sub-sector of the Agri-food and beverage sector; (vi) develop value chain mapping.

The survey form was initially drafted in Mongolian and then reviewed. This initial review led to several edits to assure that the form conformed to cultural norms, grammar and the structure of the numbering for rating questions. The corrected form was tested in late May of 2022 to see if the format and the language of the questionnaire were effective. Initial testing was with 12 mature university students at a graduate level of study, followed by piloting with 40 residents of Ulaanbaatar. Piloting with students was done in person. Feedback from the piloting led to edits to improve the logic and flow of questions and to refine questions to better reflect the recreation behavior of MSME.

A Self-assessment questionnaire (SAQ) was developed based on international research reports and studies as well as domestic reports and regulations. To make a survey more sub-sector-oriented, and to reflect the specifics of their activities, four different questionnaires with 130-135 questions have been developed. SAQs were provided in English format in the appendix.

Table 1. Questionnaire type

Questionnaire	**Sub-sector**
Self-assessment questionnaire of agricultural farmers	Agriculture
Self-assessment questionnaire of beekeepers	Bee farm
Self-assessment questionnaire of food and beverage producers	Food and beverage producers
Self-assessment questionnaire of sales and service providers	Food service
	Retailer
	Storage
	Transport

Table 2. Self-assessment questionnaire

Section	Details
Passport	Information on interview location, date, time and duration and the interviewer ID
Section 1. General information	This section consists of a total of 22 questions evaluating the field of activity, ownership type, organizational form, period of operation, number of employees, average annual income, and the general condition of the industry.
Section 2. Understanding of the eco-labelling	This section consists of 11 questions to clarify the understanding of eco-labelling.
Section 3. Company's current situation assessment	This section assesses the implementation of standards, organizational goals, objectives, plans, implementation of circular economy practices, use of digital technologies and organizational capabilities. The questions in this section are defined differently because of the different practices implemented by farmers, producers, beekeepers and retailers. It consists of 62-67 questions in total.
Section 4. Training and financial needs	This section consisted of 20 closed-ended and open-ended questions to clarify the participant's needs and types of training and consulting services, sources of funding, amount of funding needed, difficulties encountered in funding, and technological capabilities.
Section 5. Profile questions	This section consisted of 15 questions that clarified the participants' personal information such as age, gender, education, position and years of service, the number of household members participating in the household business, the amount of capital, address location, capital ownership, and whether they would receive further information, advice, or training within the project.

1.2.2. Survey method

The entire survey used face-to-face interviews in the respondent's workplaces. However, due to location and distance from the provincial center, it was impossible to complete the survey work using this approach. Thus, some samples were therefore completed by phone interview. 5.7% of the total sample was collected online, 14.7% by telephone and the remaining 79.6% in the form of face-to-face interviews.

Challenges faced during the data collection were no database of digital information and addresses of organizations operating in the sector, mismatched with the company's registered address and it is registered at the individual's home address. To solve this problem, the research team contacted the relevant state administrative institutions, made requests for information on registered enterprises and obtained lists of telephone numbers and addresses. 78 phone lists were received from the Ulaanbaatar Municipality, Department of Food and Agriculture, 427 from the

MoFALI, 114 from the Department of Food and Agriculture of Selenge Province, 93 from the Department of Food and Agriculture of Erdenet province, and 40 from the Association of Beekeepers. After shortlisting potential participants of the survey, an introduction to the project and a request to participate are made. A total of 763 phone calls are made, 519 or 68% of them refused to participate, were not related to the selected industry and had incorrect information. The remaining 106 MSMEs (14%), agreed to participate in the study, over the phone and online.

1.2.3. Sample size

A total of 42,233 organizations and households are engaged in the activities of the Agri-food and beverage sector nationwide. Among them, are 17,459 agricultural households and 423 enterprises, 58 flour factories, 870 bakery products factories, 162 water and beverage factories, 680 beekeeper households and 36 organizations, 14,078 food SMEs and 8,467 food production and service organizations registered.

742 MSMEs and retailers from 9 districts of Ulaanbaatar city, Selenge, Erdenet and Umnugovi provinces participated in the self-assessment. Of these, 444 are manufacturing and 298 are retail trade, service, transport and warehouse service providers. It was assumed that the total sample size can fully represent the total survey population. In the selected regions, the sample size is 18,943, the confidence level of the sample is 99%, and the minimum acceptable sample size is 644, a total of 742 sample sizes are collected in the study, which meets the reliability of the sample and the results can be accepted. The details of the participants involved in the self-assessment are in the second chapter.

Table 3. Sample size

Sub sector	Ulaanbaatar	Selenge	Erdenet	Umnugovi	Total
Agriculture	136	57	33	3	229
Bee farm	3	42	10	0	55
Food and beverage production	106	21	27	6	160
Retailer	94	21	19	6	140
Food service	68	18	24	4	114
Storage	4	13	3	0	20
Transport	7	8	9	0	24
Total	**418**	**180**	**125**	**19**	**742**

Source: Survey results

56% of the total samples are collected in Ulaanbaatar city, 24% are from Selenge, 17% from Erdenet and 3% from Umnugovi. Most of them (38%) are young companies that have been operating for up to 5 years, while 14% have been operating for over 21 years. 96% of the total participating organizations are domestically invested companies and their organizational form is family-owned or individual business (61%), limited liability company (LLC) (35%), joint stock company (JSC), cooperative and partnership (4%). Most of the sample is micro-enterprises with up to 10 employees (77%). The size of the organization was determined by the average annual income of the organizations and enterprises with an income of up to 299 million MNT were classified as micro (89%), with an income of 300 million to 1 billion MNT as a small organization (8%), and with an income of more than 1 billion MNT as a medium organization (remaining 4%). A summary of the sample is shown in the table below:

Table 4. Summary of survey responses

Operation sector	Agriculture	31%	**Location**	Ulaanbaatar	56%
	Beekeeping	7%		Selenge	24%
	Food and beverage production	22%		Erdenet	17%
	Retailer	19%		Umnugovi	3%
	Food production and services	15%	**Organization structure**	Family-owned and individual business	60%
	Storage	3%		LLC	35%
	Logistics	3%		Partnership	1%
Ownership types	Domestic investment	96%		Community	3%
	Foreign investment	1%		JSC	1%
	Mixed /joint venture/	3%	**Number of employees**	1-10 employees	77%
Operation time period	Up to1 year	10%		11-50 employees	20%
	1-5 years	28%		51-200 employees	2%
	6-10 years	19%		201 employees and above that	1%
	11-15 years	18%	**Average annual income**	Up to 99 mil MNT	75%
	16-20 years	11%		100-299 mil MNT	14%
	21 years and above	14%		300 mil- 1 bil MNT	7%
				1 bil MNT and above	4%

Source: Survey results

1.2.4. Survey schedule

The survey instrument was developed in May of 2022 and survey fieldwork was conducted in the period from 6 June 2022 to 6 July 2022. To increase the sample size, the data collection work has been delayed by a week and the MSMEs of Umnogovi province were added.

1.2.5. Supervision and quality control

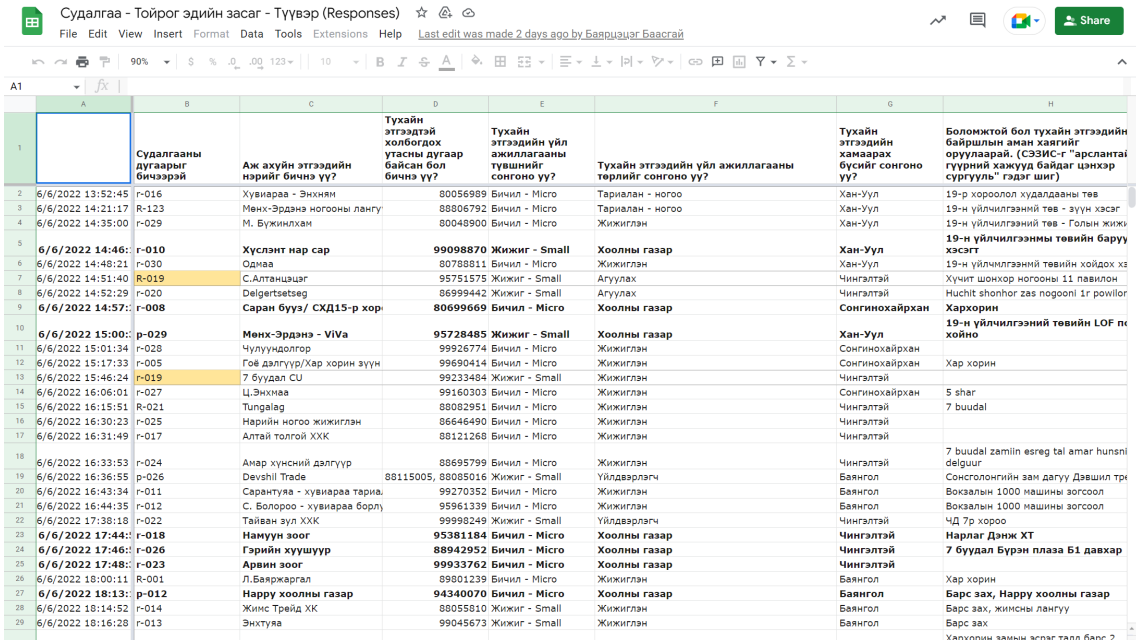
The following measures were taken to supervise field work and assure the survey quality. Interviews were completed by 12 interviewers under the supervision of a field supervisor. Initial training of interviewers involved a review of survey objectives and the survey form. Particular

attention was given to explaining the purpose and format of questions and to the importance of question delivery in a neutral manner to avoid leading the respondent. Interviewers then practiced interviewing each other face-to-face.

Interviewers called respondents in advance to make interview appointments and called 1 or 2 hours before the scheduled interview to remind the respondent. Interview duration was, on average 30 minutes, from 14 minutes up to 60 minutes, depending on the respondent's experience.

The field supervisor reviewed completed survey forms and followed up with the interviewer, if necessary, with the respondent to resolve apparent errors in coding. This work was documented in a tracking google spreadsheet.

Image 1. Survey tracking



Судалгаа - Тойрог эдийн засаг - Түүвэр (Responses)

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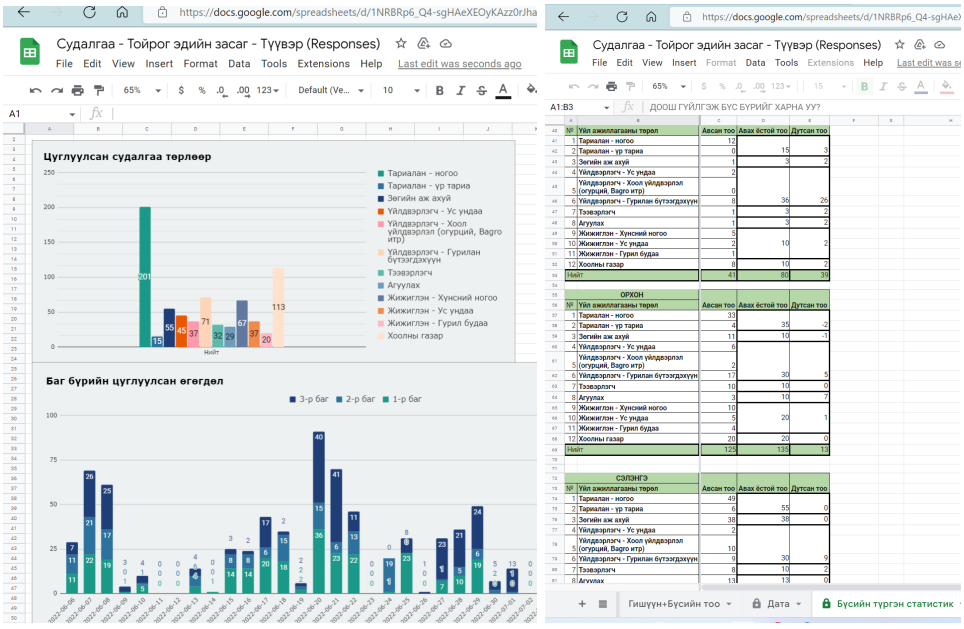
10	6/6/2022 15:00:	p-029	Мөнх-Эрдэнэ - ViVa	95728485	Жижиг - Small	Хоолны газар	Хан-Уул	19-н үйлчилгээний төвийн LOF по хойно
11	6/6/2022 15:01:34	r-028	Чулуундолгор	99926774	Бичил - Micro	Жижиглэн	Сонгинохайрхан	
12	6/6/2022 15:17:33	r-005	Гөё дэлгүүр/Хар хорин зүүн	99690414	Бичил - Micro	Жижиглэн	Сонгинохайрхан	Хар хорин
13	6/6/2022 15:46:24	r-019	7 бүудал CU	99233484	Жижиг - Small	Жижиглэн	Чингэлтэй	
14	6/6/2022 16:06:01	r-027	Ц.Энхмаа	99160303	Бичил - Micro	Жижиглэн	Сонгинохайрхан	5 shar
15	6/6/2022 16:15:51	R-021	Tungalag	88082951	Бичил - Micro	Жижиглэн	Чингэлтэй	7 buudal
16	6/6/2022 16:30:23	r-025	Нарийн ногоо жижиглэн	86646490	Бичил - Micro	Жижиглэн	Чингэлтэй	
17	6/6/2022 16:31:49	r-017	Алтай толгой ХХК	88121268	Бичил - Micro	Жижиглэн	Чингэлтэй	
18	6/6/2022 16:33:53	r-024	Амар хүнсний дэлгүүр	88695799	Бичил - Micro	Жижиглэн	Чингэлтэй	7 buudal zamiin esreg tal amar hunsni delguur
19	6/6/2022 16:36:55	p-026	Devshil Trade	88115005, 88085016	Жижиг - Small	Үйлдвэрлэгч	Баянгол	Сонсголонгийн зам дагуу Дэвшил тр
20	6/6/2022 16:43:34	r-011	Сарантуяа - хувираа тариа	99270352	Бичил - Micro	Жижиглэн	Баянгол	Вокзалын 1000 машины зогсоол
21	6/6/2022 16:44:35	r-012	С. Болороо - хувираа борлу	95961339	Бичил - Micro	Жижиглэн	Баянгол	Вокзалын 1000 машины зогсоол
22	6/6/2022 17:38:18	r-022	Тайван эүл ХХК	99998249	Жижиг - Small	Үйлдвэрлэгч	Чингэлтэй	ЧД 7р хороо
23	6/6/2022 17:44:	r-018	Намуун зоог	95381184	Бичил - Micro	Хоолны газар	Чингэлтэй	Нарлаг Дэнж ХТ
24	6/6/2022 17:46:	r-026	Гэрийн хуушуур	88942952	Бичил - Micro	Хоолны газар	Чингэлтэй	7 буудал Бүрэн плаза Б1 давхар
25	6/6/2022 17:48:	r-023	Арвин зоог	99933762	Бичил - Micro	Хоолны газар	Чингэлтэй	
26	6/6/2022 18:00:11	R-001	Л.Баяржаргал	89801239	Бичил - Micro	Жижиглэн	Баянгол	Хар хорин
27	6/6/2022 18:13:	p-012	Нарру хоолны газар	94340070	Бичил - Micro	Хоолны газар	Баянгол	Барс зах, Нарру хоолны газар
28	6/6/2022 18:14:52	r-014	Жимс Трейд ХК	88055810	Жижиг - Small	Жижиглэн	Баянгол	Барс зах, жимсны лангуу
29	6/6/2022 18:16:28	r-013	Энхтуяа	99045673	Жижиг - Small	Жижиглэн	Баянгол	Барс зах

Image 2. Sample tracking



Судалгаа - Тойрог эдийн засаг - Түүвэр (Responses)

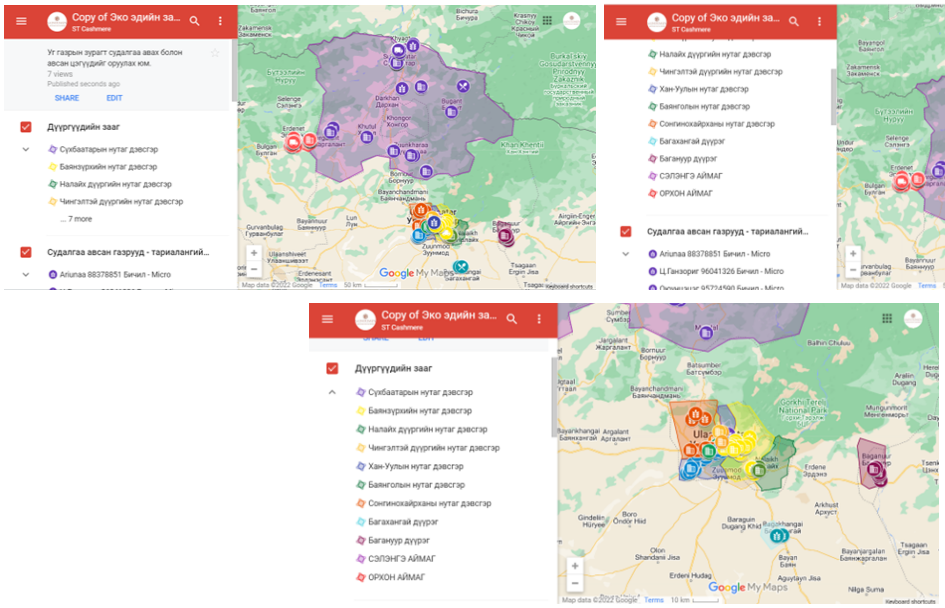
Цуглуулсан судалгаа төрлөөр

Баг бүрийн цуглуулсан өгөгдөл

Survey data were coded into an excel spreadsheet using a structured format. The 2 specialists reviewed the partial database created after the first few days of coding to check for anomalies and errors and to confirm that responses were reasonable. The sample size was tracked and integrated progress reports were daily. As part of the geographic mapping task of the assignment, the type of activities and location of the respondents have mapped on the google map and the distribution of the sample was tracked daily. Fieldwork was finished, a final check was

completed to test the representativeness of the sample and data were converted into the SPSS 23.0 program. Tests focused on sub-sectors, location and MSME's size.

Image 3. Location tracking



1.3. Individual interview

Individual interviews were conducted with stakeholders in the Agri-food and beverage sector. A total of 16 people were interviewed for about an hour each and the questions and answers varied depending on the industry. Common questions include:

- The Agri-food and beverage sector's current situation;
- List of MSMEs eligible for assessment;
- Government policies and regulations;
- Current situation of green labelling;
- The green certification process, time, cost and challenges;
- MSME's goals, implemented activities, and capabilities;
- Challenges and difficulties;
- Funding needs.

Table 5. List of interviewees

№	Name	Organization	Position
1	Munguntsatsral	Department of Professional Inspection	Head of department
2	Munkhtur	Department of Food and Agriculture of Selenge province	Head of department

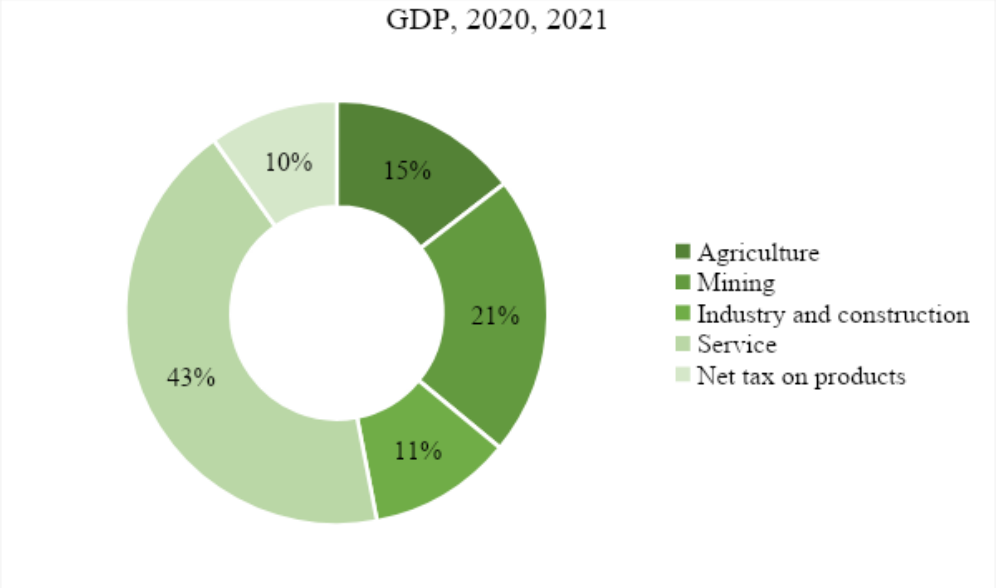
3	Undarmaa	Ulaanbaatar Municipality, Department of Food and Agriculture	Head of department
4	Bat-Ulzii	Department of Food and Agriculture of Erdenet province	Head of department
5	Onon	MoFALI	Head of department
6	Gerelzaya	MoFALI	Head of department
7	Enkhtur	MoFALI	Head of department
8	Enkhtsetseg	Mongolian Association of Foodies	
9	Enkhtsetseg	MNCCI	Membership specialist
10	Oyuntuya	Selenge Organic CCO	Partner
11	Amarsaikhan	Darkhan Agricultural Institute	Agronomist
12	Khandaa	Agricultural retail store	Owner
13	Undral	Khan Jims SBT	Financial director
14	Shurentsetseg	Association of Beekeepers	Head of association
15	Shijirtuya	Beekeeper of Selenge province	
16	Sanchir	Golomt bank	Economist of loan

2. THE AGRI-FOOD AND BEVERAGE SECTOR ASSESSMENT

2.1. The Agri-food and beverage sector's current situation

The share of the agricultural sector in the GDP reached 13.6% in 2021 and decreased by 4.6% from the previous year. Although the ranking has declined due to the development of the mining sector, it remains an important sector of the economy. The purpose of the in-depth assessment is to determine the current situation of the Agri-food and beverage sector and the sub-sectors of agricultural, beekeeping, food and beverage production and retailers.

Figure 2. GDP, 2021-2022



Source: 1212.mn

Agricultural sub-sector. The amount of cultivated area tends to increase every year and in 2021, 675,000 hectares of land were planted in the country.

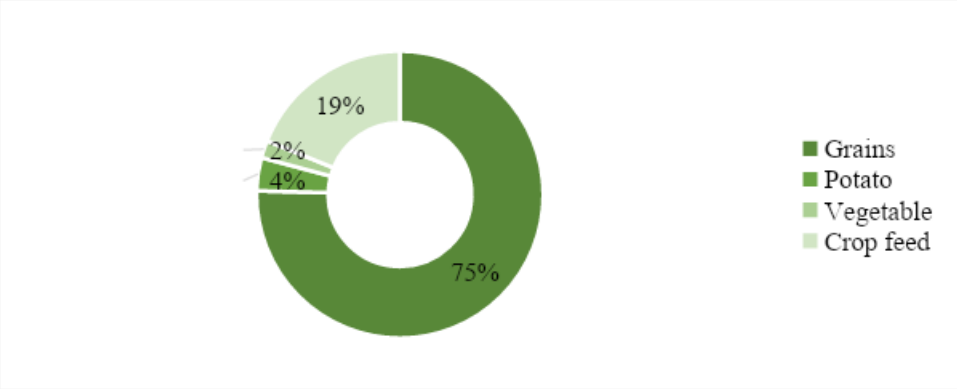
Table 6. Amount of cultivated area, by hectares

Province	2017	2018	2019	2020	2021
National total	527,019.71	511,830.48	526,049.77	591,157.71	675,108.40
Erdenet	2,620.66	3,906.19	2,972.06	3,703.73	5,335.80
Umnugovi	203.71	283.25	284.61	276.54	216.5
Selenge	209,261.83	200,029.32	207,381.05	221,864.72	224,902.10
Ulaanbaatar	1,076.07	1,051.32	1,139.84	1,866.04	1,493.80

Source: 1212.mn

34% of the total cultivation will be allocated to Erdenet city, Umnugovi and Selenge provinces. Selenge province is the leader in terms of the cultivated area and the amount of cultivation, while the cultivation of potatoes and vegetables is more in Umnugovi province. 75% of the total cultivation was grain and the remaining percentage was potatoes, vegetables, delicate vegetables and crop feeds.

Figure 3. Types of agricultural products, 2021



Source: 1212.mn

The number of agricultural organizations tends to increase every year. There are 1,615 enterprises and 17,459 households in the country, mostly located in Selenge province and Ulaanbaatar.

Table 7. Number of agricultural organizations

Province	2017	2018	2019	2020	2021
Erdenet city	11	14	13	11	14
Umnugovi	24	25	22	14	17
Selenge	334	318	322	322	336
Ulaanbaatar	35	57	48	58	56
Total	404	414	405	405	423
National total	**1,447**	**1,422**	**1,401**	**1,498**	**1,615**

Table 8. Number of agricultural households

Province	2017	2018	2019	2020	2021
Erdenet city	487	688	402	884	462

Umnugovi	379	382	101	322	219
Selenge	3,703	3,386	87	3,698	3,397
Ulaanbaatar	1,456	1,456	1,389	1,251	1,302
Total	6025	5912	1979	6155	5380
National total	**15,985**	**15,862**	**14,728**	**16,292**	**17,459**

Source: 1212.mn

Beekeeping sub-sector. In 2021, 36 organizations and 680 households are engaged in beekeeping and 13,708 bee hives have been counted. According to the statistics of recent years, the number of beekeepers tends to increase.

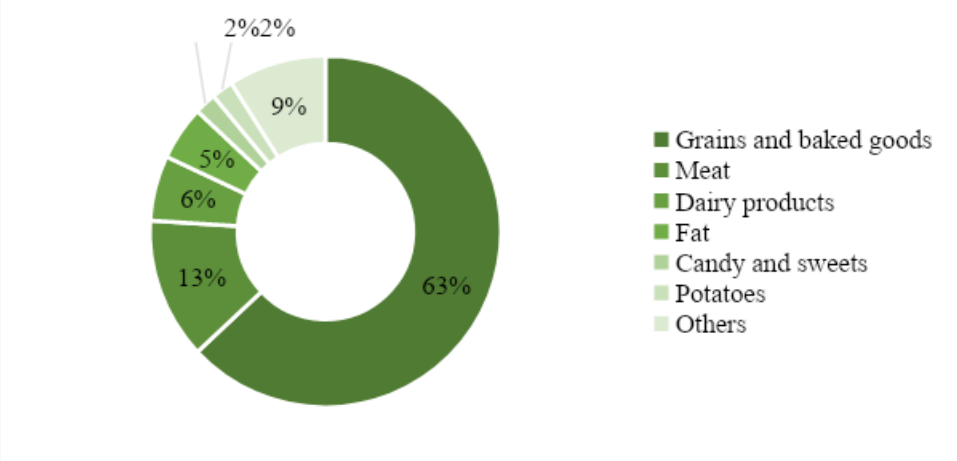
Table 9. Number of beekeepers

Year	Organization	Households	Number of beehives
2010	68	-	2,255
2015	161	-	6,309
2016	60	445	9,276
2017	31	397	11,492
2018	75	344	8,848
2019	56	877	12,250
2020	31	577	13,500
2021	36	680	13,708

Source: MoFALI

Food and beverage production sub-sector. The production of flour and baked products, pickled vegetables and fruits and water and beverages makes up the structure of the food and beverage production sub-sector. Flour and baked products are the main consumer products of the population, and according to research, they account for 63% of the daily food consumption of the population.

Figure 4. Daily food consumption



Source: MoFALI

In 2020, there are 58 flour mills and workshops with an installed capacity of 940,000 tons of grain milling in the country and 10 flour mills and workshops are operating regularly, which is 30% of the total capacity. More than 870 factories and workshops of flour and baked products with a total capacity of 235.1 thousand tons are operating and 57.0 thousand tons of baked goods and 34.4 tons of candy are produced.[6]

Table 10. National production of flour and baked goods, by year

	Product type	2016	2017	201	2019	2020
1	Flour /thousand tons/	209.7	209	211.1	211.6	235.1
2	Baked goods /thousand tons/	38.7	41.9	47.2	51.1	57
3	Candy /tons/	34.4	51.2	53.6	45.5	34.4

Source: MoFALI.

30 beverage factories, 90 bottled water factories and 44 juice factories, a total of 162 beverage factories are operating in Mongolia.[7]

Table 11. Production of various beverages, thousands of liters

		2016	2017	2018*	2019	2020
1	Water	59104.7	60682	73740.3	98640.5	75568.5
2	Sweet water and drinks	128887.6	148073.4	166182.9	174894.6	204988.4
3	Juice	55762	67003.3	64933.7	64417.4	62602.4

Source: MoFALI

[6] https://mofa.gov.mn/exp/blog/10/82
[7] https://mofa.gov.mn/exp/blog/10/83

Retail sub-sector. Retailers, food service, transportation and storage service providers participated in the self-assessment. There are a total of 6,266 places of food retail trade and services in Ulaanbaatar city.

Table 12. Number of retailers, by category

№	Category	Types of stores	Capacity, sq.m		Total
			Ulaanbaatar	Rural area	
1	Big	Hypermarket +	33	10	43
2	Medium	Supermarket +	142	175	317
3	Small	Minimarket +	670	574	1244
4		Convenience store	84	70	154
5	Micro	Grocery store	3638	6332	9970
6		A shop next to the gas station	30	69	99
7		Truck store	1669	582	2251
8	Non-food	A specialty stores	520	1048	1568
9		Outlet +	30	3	63
10		Boutique +	53	1	54
Total			6899	8864	15763

Source: MoFALI

In addtion, there are about 8,500 enterprises operating in the food production and service sector, of which 47% are located in the provinces and 53% are located in the capital city. According to the type of service, restaurants and hotel food production (1,570), karaoke bars (1,331), kindergartens and schools (1,600), and restaurants of public service establishments for the majority. Sub-sector employs more than 40,000 people. The total number of seats in the dining hall is 600-650 thousand.[8]

Table 13. Number of food production and services, by category

№	Service category	Province	Ulaanbaatar	Total
1	Restaurant	256	1021	1570

[8] https://mofa.gov.mn/exp/blog/10/85

2	Restaurant next to the hotel	160		
3	Restaurant next to the resort	133		
4	Cafe	121	225	400
5	Coffee shop	54		
6	Bar /karaoke, beer/	386	945	1331
7	Fast food restaurant	85	-	85
8	Hospitals and sanatoriums	444	100	544
9	Kindergarten, school (private and public)	915	685	1600
10	Dormitory	273	10	283
11	Vocational training centers and universities	51	35	86
12	Industrial and official organizations	119	1297	2421
13	Military class	35		
14	Penitentiary	18		
15	Resort	109		
16	Along the road /home, others/	243		
17	Independent	558		
18	Buffet	4		

19	Bakery, culinary	38		
Total		**4002**	**4318**	**8320**

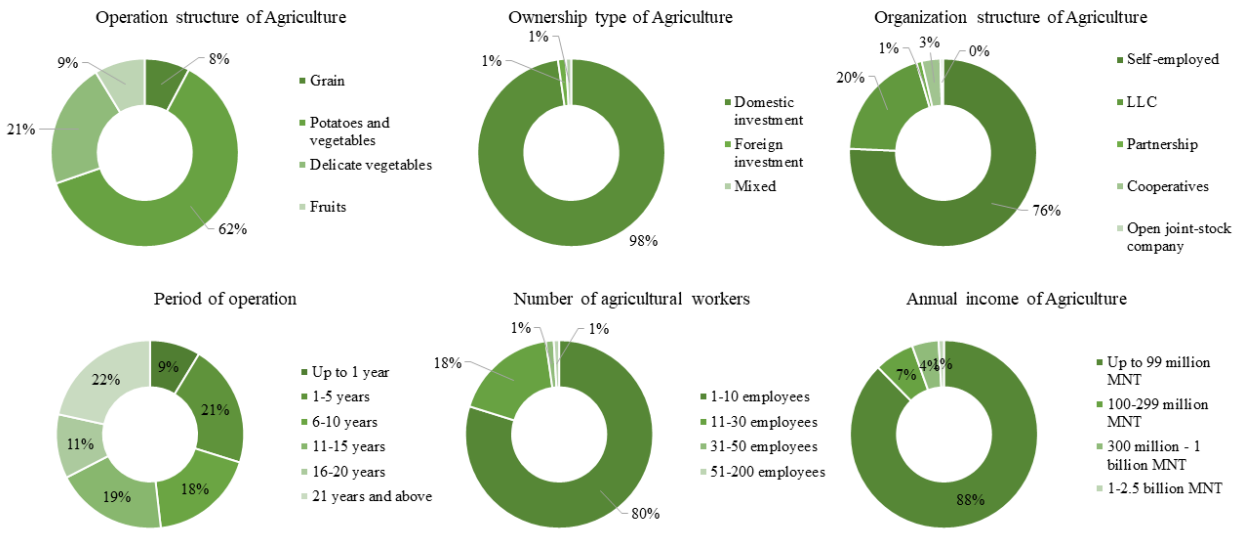
Source: MoFALI

2.2. General information of sub-sectors

The general situation of the sub-sectors was determined by 6 factors: direction of operation, ownership, organizational structure, duration of operation, number of employees, and average annual income.

Agriculture. 8% of farmers grow grains, 62% grow potatoes and vegetables, 21% grow delicate vegetables, and the remaining 9% grow fruits**.** Most of them have domestic investments, 76% of them are family-owned or individual businesses and 20% are LLCs. The distribution of the duration of the operation is even, but most of them have 1-10 employees and the average annual income is up to 99 million MNT.

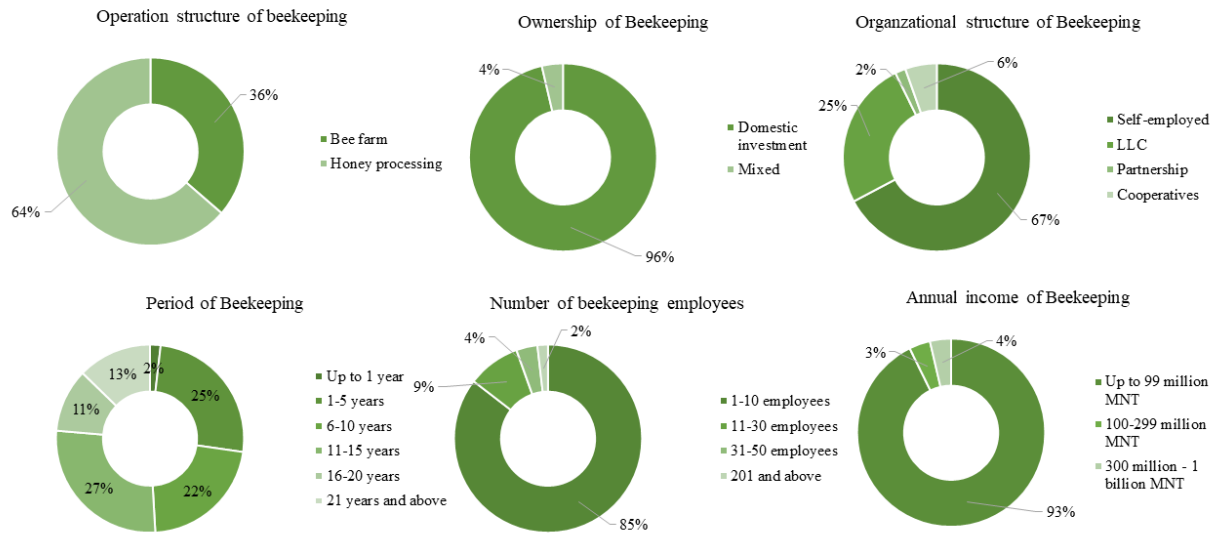
Figure 5. General information for farmers



Source: Survey results

Beekeeping. 64% of beekeepers produce honey, self-employed with domestic investment (67%) and LLCs (25%). The distribution of the period of operation is also even, with 1-10 employees and an average annual income of up to 99 million MNT.

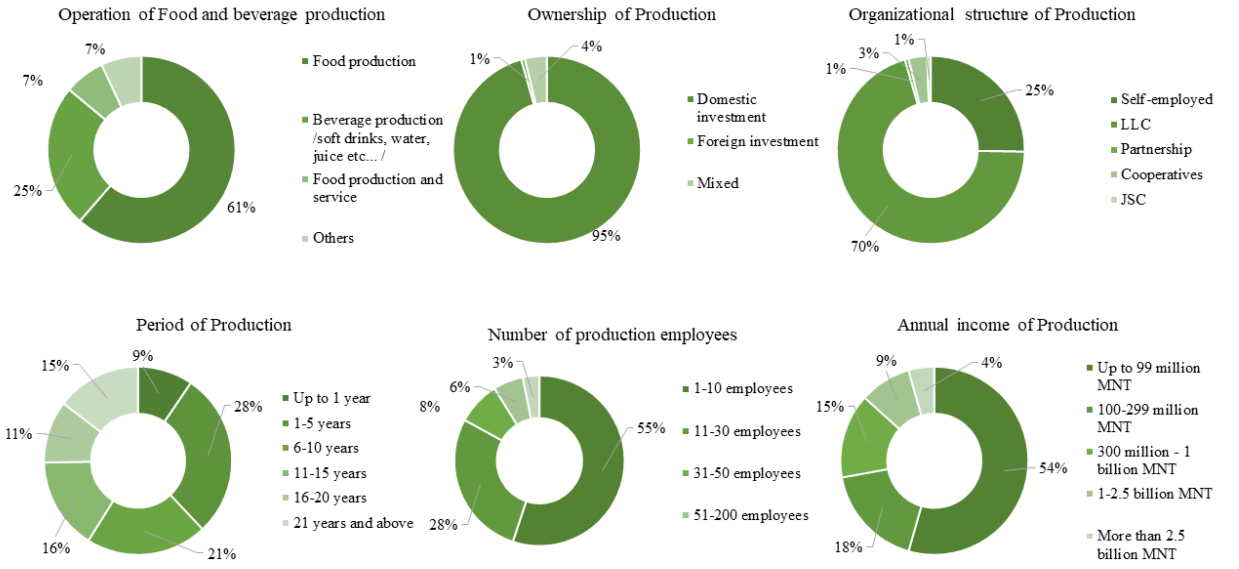
Figure 6. General information for beekeepers



Source: Survey results

Food and beverage production. 61% of the food and beverage producers are food producers, 25% are water and beverage producers, 7% are food production, and 95% are domestically invested. Unlike other sub-sectors, 70% of them are organized as LLCs. The distribution of the period of operation is also normal, however in addition to micro-businesses, small (36%) and medium-sized (9%) organizations with 11-50 employees make up half of them. 54% have an average annual income of 99 million, 18% have an income of 100-299 million, 15% have an income of up to 1 billion and 9% have an income of up to 2.5 billion.

Figure 7. General information for food and beverage producers

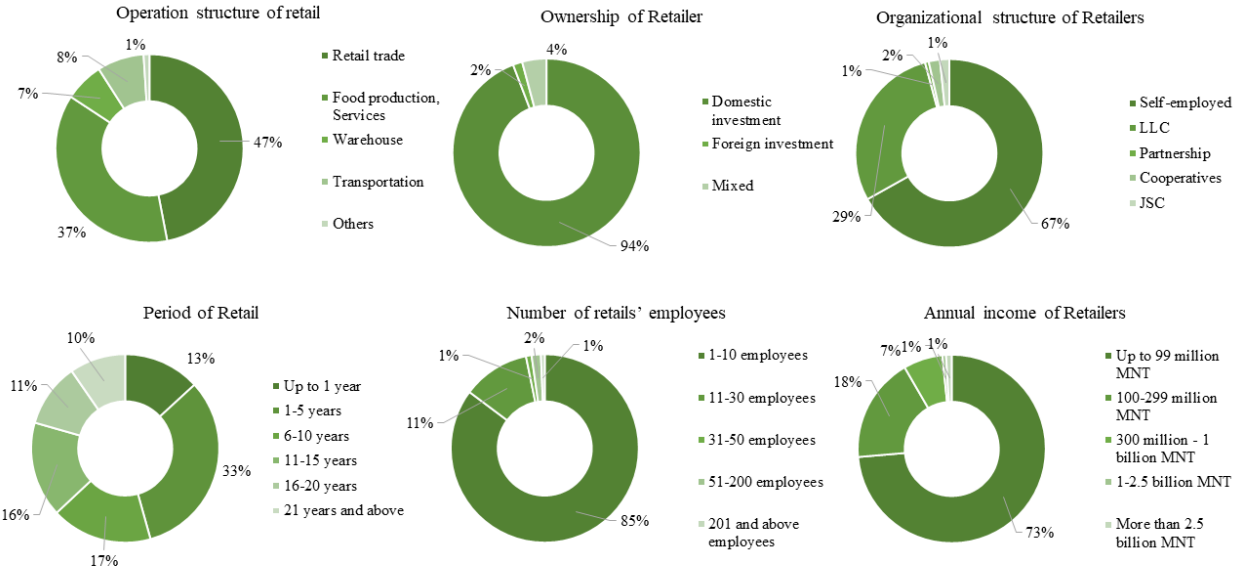


Source: Survey results

Retail. 47% are retailers, 37% are food production and services, 7% are warehouses and 8% are transportation service providers. MSMEs are mostly domestically invested. In terms of

organizational structure, 67% are self-employed and 29% are LLCs. The most of them have 1-10 employees and the income is 99 million MNT.

Figure 8. General information for retailers

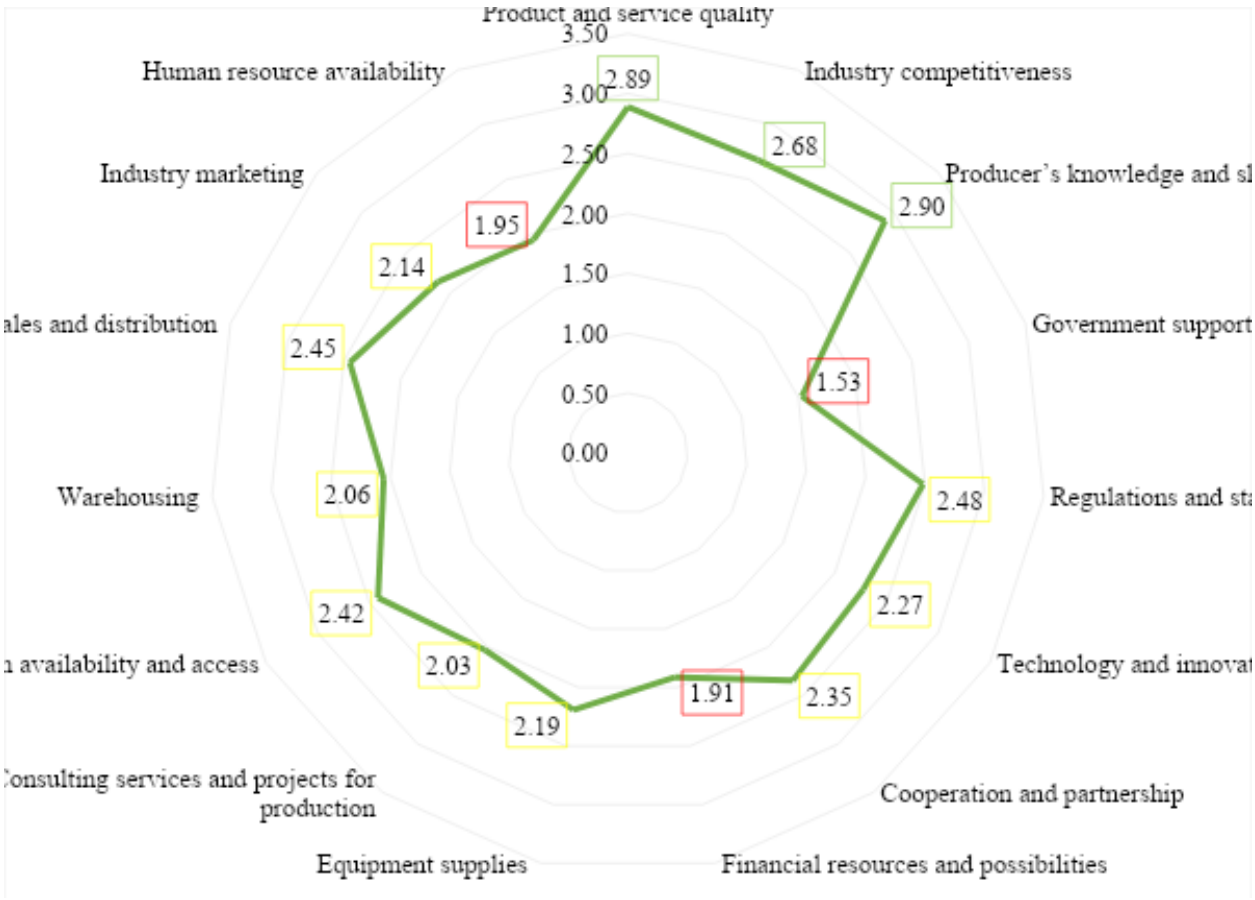


Source: Survey results

2.3. Assessment of the general situation of the Agri-food and beverage sector

The participants of the self-assessment questionnaire evaluated the current situation of the industry on a scale of 1-4, and the mean value of the evaluation is 2.28, which means that the current situation of the industry is unsatisfactory. Product quality and manufacturer expertise (2.9) received the highest ratings, while industry competitiveness (2.68), regulations and standards (2.48), sales systems (2.45), information availability (2.42), cooperation and partnership (2.35), technical, technological innovation (2.27) has an average value. However, equipment supply (2.19), industry marketing and advertising (2.14), warehouse system (2.06), production consulting organization projects (2.03) were rated low, while the availability of professional human resources (1.95), financial opportunities (1.91), government ground support (1.53) has a very poor rating. Among the additional factors, suggestions related to the supply of packaging were predominant.

Figure 9. The Agri-food and beverage sector's current situation



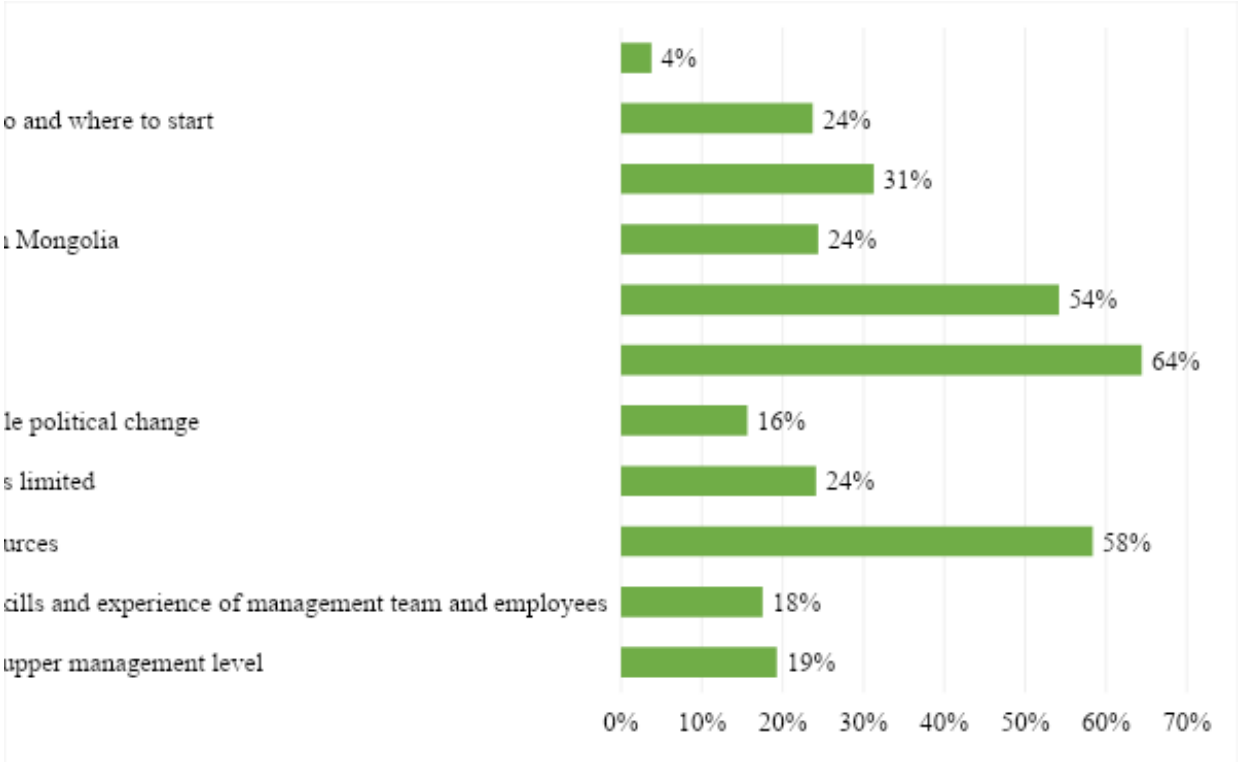
Source: Survey results

2.4. Challenges for the Agri-food and beverage sector

64% of all participants answered that there is a lack of investment, 58% lacks financial resources and 54% current operating costs are high, which are the main problems facing the industry.

Other problems and challenges include natural and climate factors, seasonal effects, the limited number of sales channels, demarcation of agricultural and livestock zoning, high pressure from the government, a multi-step process, the large influence of large companies, low availability of equipment, price problems such as high, low customer knowledge and lack of professional human resources are mentioned.

Figure 10. Challenges for the sector



Source: Survey results

A total of 543 participants (73.1% of all participants) submitted their opinions to the open-ended question to clarify the priorities for the organization to develop the principle of "being environmentally friendly". Analysis using the NVIVO program, which analyzes the results of qualitative research, shows that MSMEs need funding, training, consultancy and government support as a priority.

Image 4. Suggestions for priority implementation

Source: Survey results

3. CAPACITY OF THE AGRI-FOOD AND BEVERAGE SECTOR

3.1. Eco-labelling

3.1.1. Green certification

MNS 6737:2018 Good Agricultural Practices (GAP), ISO 22000 Food Safety Management System and ISO 14001 Environmental Management System, "Certified organic" eco-label and "Organic food certification label" green certificates have been introduced. However, the results of the self-assessment showed that the implementation and compliance of these standards by organizations are relatively weak.

Table 14. Evaluation of the implement standards

Standards		Not heard of these	No, it is not planned	No, but it is planned	Yes, early stages of implementation	Yes, it has been implemented	Total
The certified organic eco-label of MNCCI	Q-ty	90	228	287	46	91	742
	%	12%	31%	39%	6%	12%	100%
Organic food certificate of the MoFALI	Q-ty	89	248	275	52	78	742
	%	12%	33%	37%	7%	11%	100%
MNS 6737:2018 Good Agricultural Practices	Q-ty	139	226	232	61	84	742
	%	19%	31%	31%	8%	11%	100%
ISO 22000 Food safety management system	Q-ty	94	183	251	85	129	742
	%	13%	25%	34%	11%	17%	100%
ISO 14001 Environmental Management system	Q-ty	126	228	241	72	75	742
	%	17%	31%	32%	10%	10%	100%

Source: Survey results

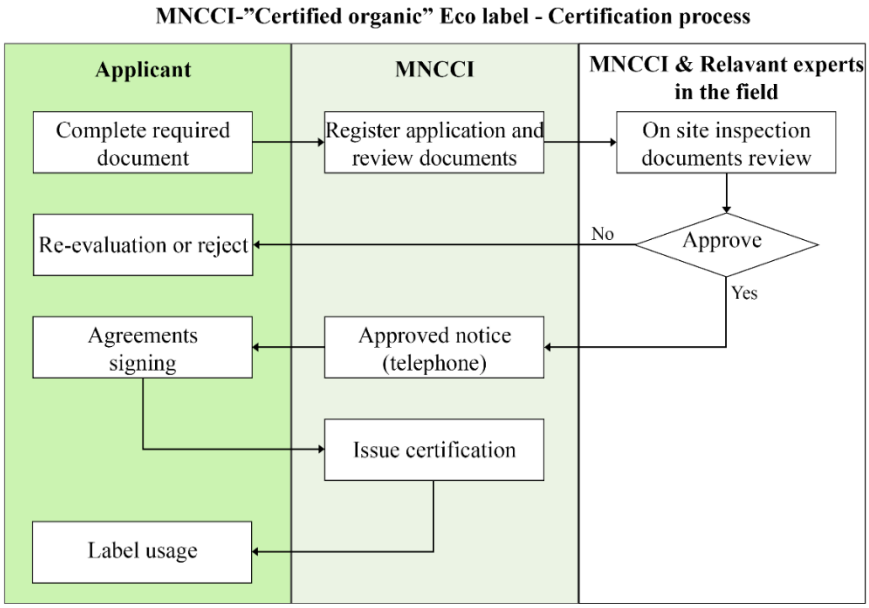
The certified organic, eco-label of MNCCI and Organic food certificate of the MoFALI are selected from Agricultural standards and the implementation process and problems were studied in detail.

Table 15. Agricultural green certificates

№	Certificate Name	Organization	Brief Description	Label
1	"Certified organic" eco-label	MNCCI	In 2016, the MNCCI started issuing the "Certified organic" eco-label on a voluntary basis for products made from national and natural raw materials and currently 60 organizations have received the certificate.	
2	Organic food certificate	MoFALI	Certification to organic agriculture producers and importers. By October 2021, 417 organic and transitional organic food products have been registered.	
3	MNS 6737:2018 Good Agricultural Practices (GAP)	MoFALI	GAP refers to the primary production of animal, animal and plant food raw materials and products, as well as the conditions and activities required to ensure their safety. By 2021, 40 organizations have received certificates.	

According to a specialist of MNCCI, the certified organic eco-labelling process consists of 8 steps as shown in the figure below. A team of experts from the MNCCI and experts in the field review documents and conduct on-site inspections and the entire certification process is organized with less difficulty and clearly to manufacturers.

Image 5. The certification process for Organic product eco-label



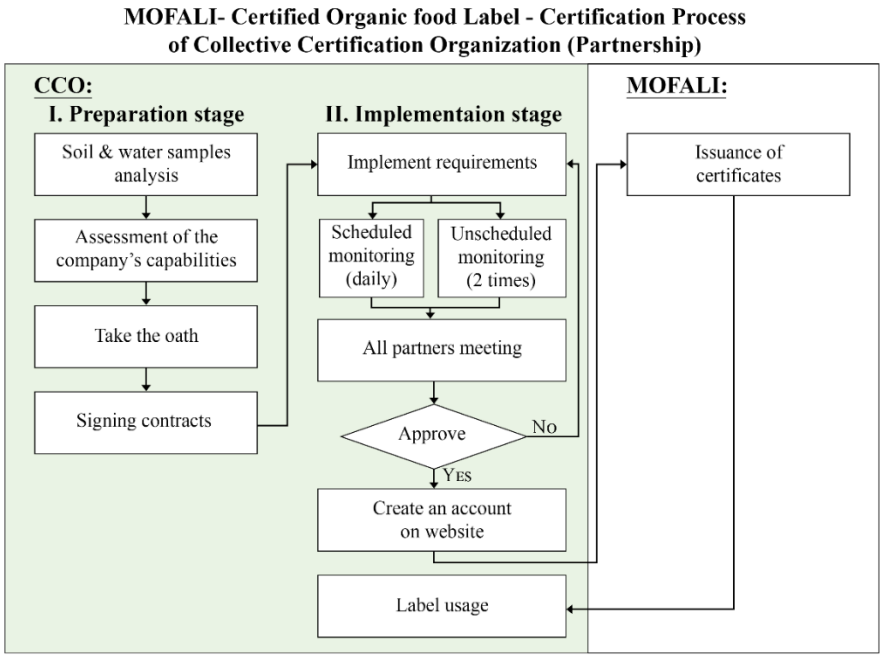
Source: Interview results

Online applications are available, but manufacturers often prefer to submit applications and other required documents in person. The on-site evaluation and decision-making process lasts a total of 14 days, and if more than 80% of the 10 requirements for organic products are met, the certification is granted. The fee for obtaining a certificate for one type of product is 500,000 MNT. In Monglia, 60 factories that have received the certificate of organic products. Obtaining this certificate increases export opportunities for manufacturers and becomes a supplier to large international and domestic organizations, but it is believed that the low coverage is due to a lack of knowledge and information for manufacturers, they do not understand the importance of the certification or neediness of the obtaining certificate may not have arisen yet.

In an interview with the partner of Selenge Organic Collective Certification Organization (CCO), the procedure of obtaining the organic food certification label, the current situation and the difficulties were clarified. Selenge Organic CCO operates as a partnership and is a collective certification organization with 16 branches. Collective certification will be responsible for collective implementation and collective monitoring of the Organic Food Law and Regulations of Mongolia. ADRA Mongolia International Organization's "Organic Agriculture Partnership" project started with the development of organic agriculture production in Selenge province to establish a collective certification system, supply value-added final products to the market and improve the livelihood of local people for 4 years. The project will end in December 2022.

The process of certification of organic food by CCO consists of 2 main parts, the steps are detailed in the figure below. 928 producers participated in the Organic Agriculture Partnership, 378 factories took an oath within Selenge Organic CCO and its other 15 affiliates and 320 factories are ready for certification as having met the requirements of 100% organic products. Currently, joint certification of organic food products is implemented in beekeeping, fertilizer production and agriculture. The stages of transitional organic and 100% organic will last one year each and at least 1-2 million MNT will be spent on scheduled and unscheduled monitoring of members of the CCO. A CCO consists of at least 5 producers and 3 users, and the right to use the mark arises when a decision is made at a meeting of all members of the CCO to issue a certificate. Currently, Selenge Organic CCO has signed product supply contracts with an organic food store and 5 large organizations and has been able to gain regular customers. The process of obtaining an organic product label is relatively complicated and requires time and commitment. For MSMEs in Mongolia, knowledge is insufficient. For example, 300 of the above-mentioned 928 producers cannot access the database of organic food products (organic.gov.mn) due to insufficient information technology skills.

Image 6. The certification process for Certified organic food label

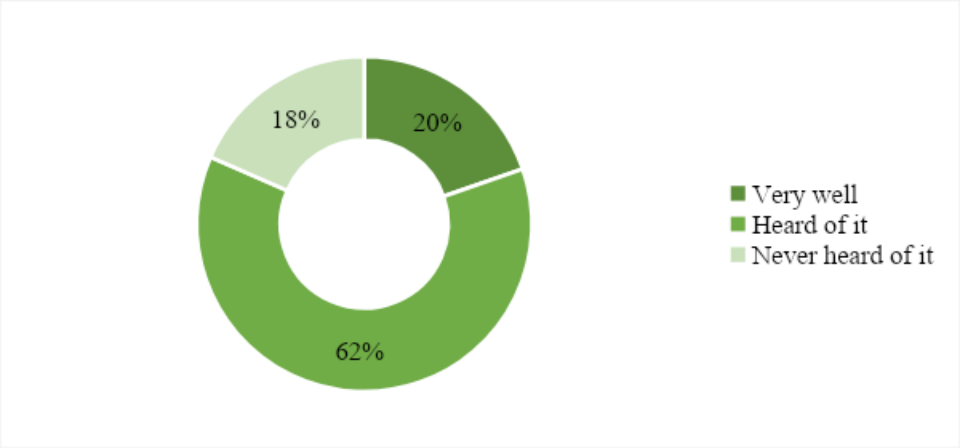


Source: Interview results

3.1.2. Understanding of eco-labelling

The second section of the self-assessment questionnaire has 2 questions related to Eco-labelling, and measures awareness, attitudes, and perceptions of the eco-labelling using 11 indicators. As can be seen from the results, only 20% of the total 742 respondents, who took part in the assessment, were well aware of Eco-labelling, while 62% had heard and the rest 18% had never heard of it. According to sort the result of the survey, the majority of participants (49.3%) who have never heard of eco-labelling are farmers. In contrast, the producers of food, water, and beverages are more aware of this understanding (30.8% of participants). There were no differences in responses by geographic location. The question format is based on the 5-point Likert scale of agreement, which allows the respondent to respond to each proposed Eco-labelling indicator using 5 responses. The response format and a typical set of survey responses for the eco-labelling questions are as follows.

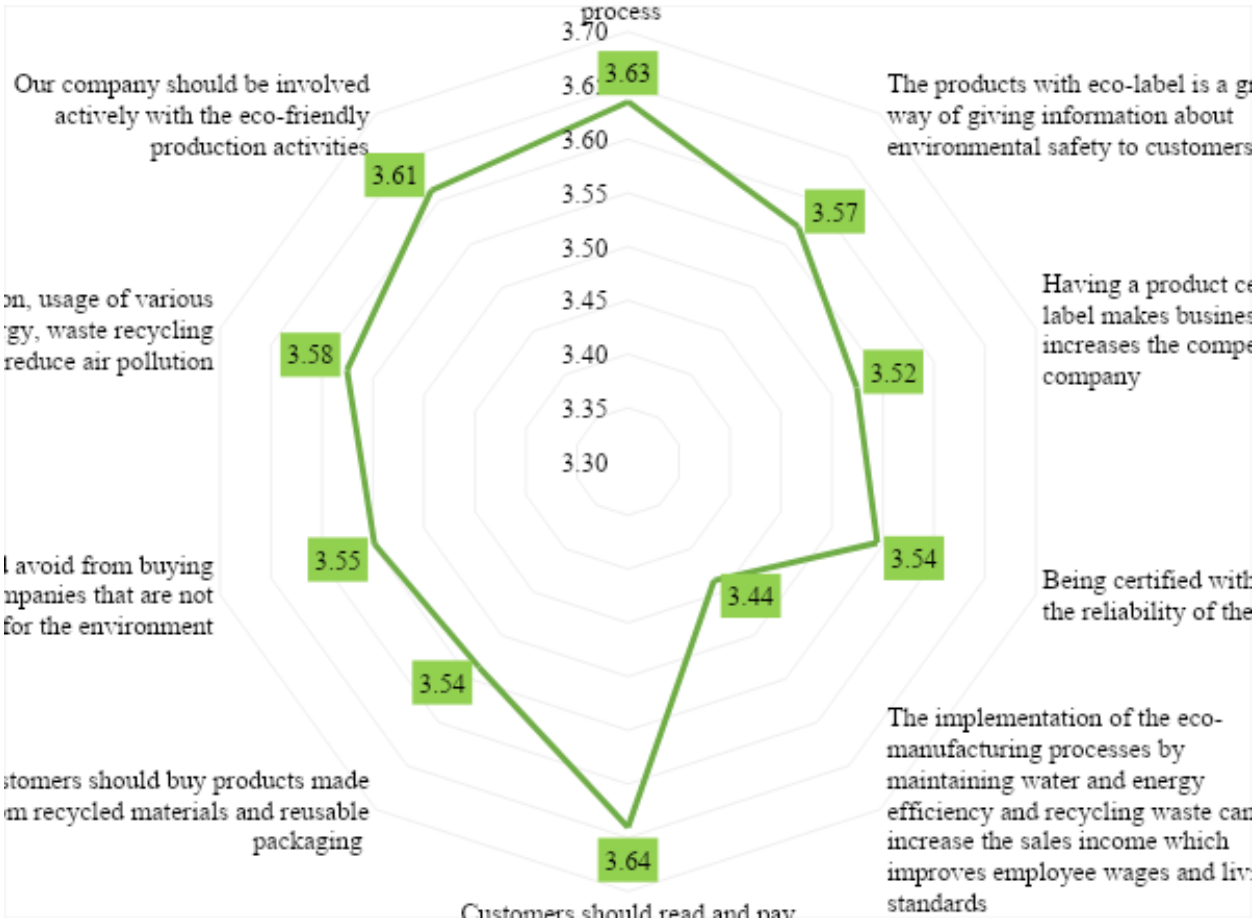
Figure 11. Understanding of eco-labelling



Source: Survey result

The average value (mean) of the 10 indicators that determine the perception and attitude toward Eco-labelling is shown in the following graph. Participants generally agree on the factors that point to the importance of eco-labelling. Among the indicators, green production increases sales and has a positive effect on the wages and living standards of employees has the lowest rating, which may indicate that its importance is not fully understood. There were no differences in responses by geographic location. As a result of the factor analysis, the representatives of the participating organizations agreed that certifying their products with an eco-label would be efficient, rational, and reliable, and the consumer should read the label and buy environmentally friendly products.

Figure 12. The perception and attitude towards eco-labelling



Source: Survey results

3.2. Training and financing needs

3.2.1. Training needs

The survey identified the need for training and consulting services. 58% of MSMEs, especially beekeepers, provide constant training on waste collection, sorting and recycling. 80% of beekeepers cooperate with other enterprises and individuals in the field of training and consulting, while 70% of farmers and retailers do not cooperate at all.

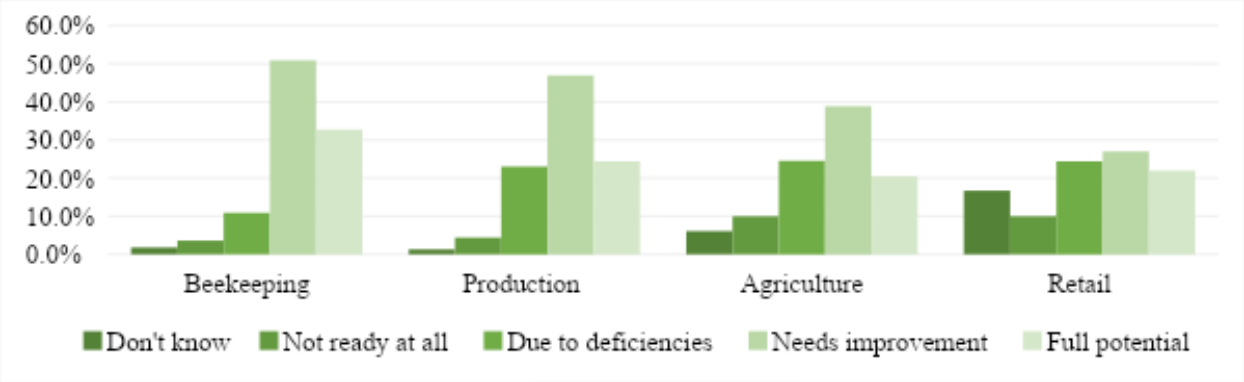
Table 16. Waste management training

Question	Agriculture	Beekeeping	Production	Retail
Percentage of training on waste collection, sorting and recycling systems	45%	78%	65%	45%
The percentage of companies cooperating with individuals in obtaining training and consulting services	25%	80%	n/a	30%

Source: Survey results

Regardless of whether the training activities are conducted or not, when the participants evaluated their organization's capacity and readiness to organize training on environmental friendliness and eco-labelling, the average rating was 2.62. The graph below shows that the pursuit to conduct training is higher for beekeepers, while the retailers are less prepared in the field of training. See section 3.3 of the report for an integrated assessment of institutional capacity.

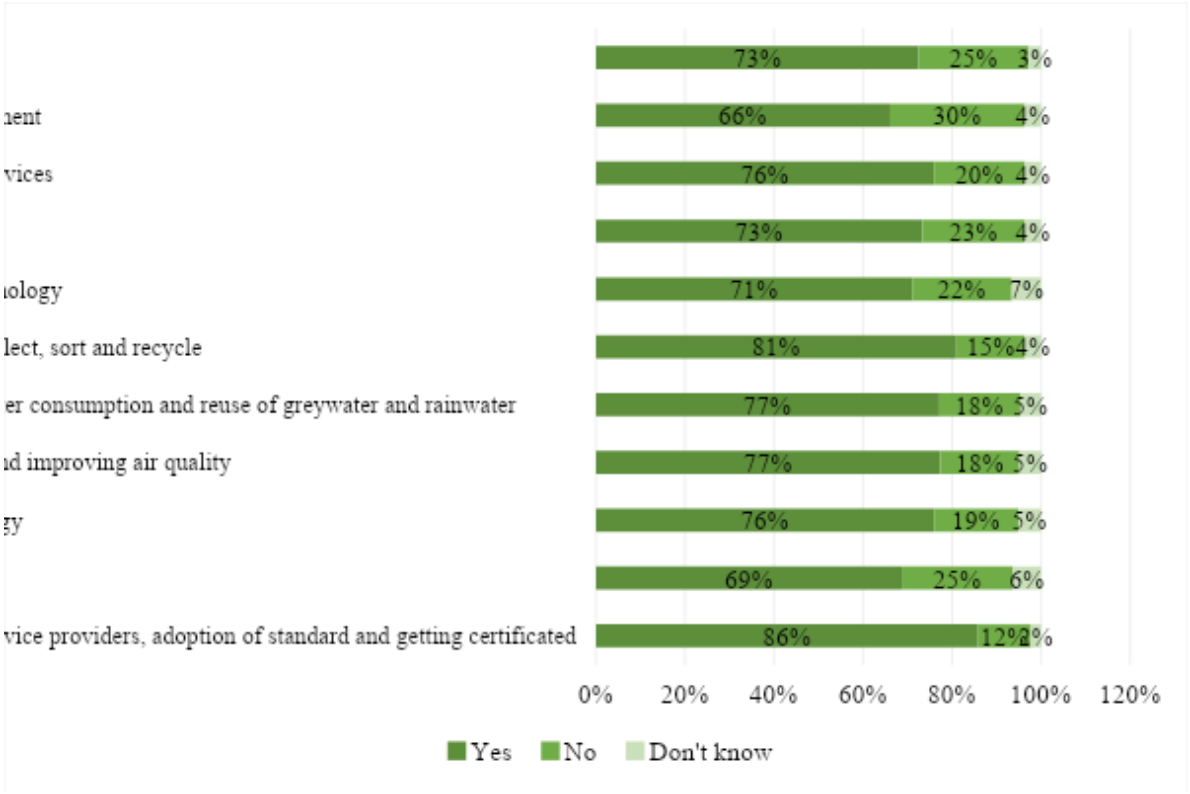
Figure 13. Self-assessment of learning ability



Source: Survey results

To determine the direction of training to be implemented within the project, the participants of the survey were asked questions to determine the training that is needed in the future. Out of the total of 11 types of training areas, all areas are needed, but the priority is the implementation of waste management systems and eco-standards, as well as certification training.

Figure 14. Need for training and consultancy services



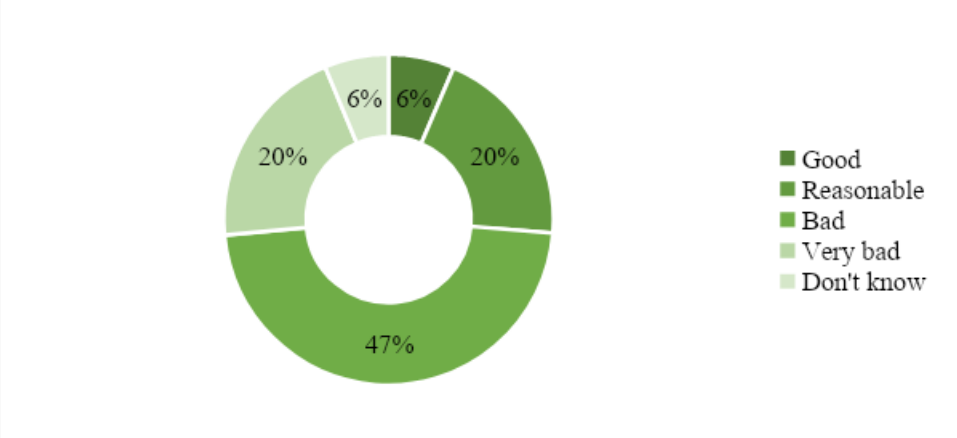
Source: Survey results

3.2.2. Financial needs

In addition, the survey questionnaire clarified the financial needs, sources and amount of funding through 5 questions. In the assessment of the current situation of the Agri-food and beverage sector, all participants assessed the possibility of obtaining funding as insufficient (section 2.3 of the report). The financial sector of Erdenet and Umnogovi province was evaluated as reasonable, but overall, it was evaluated as below average.

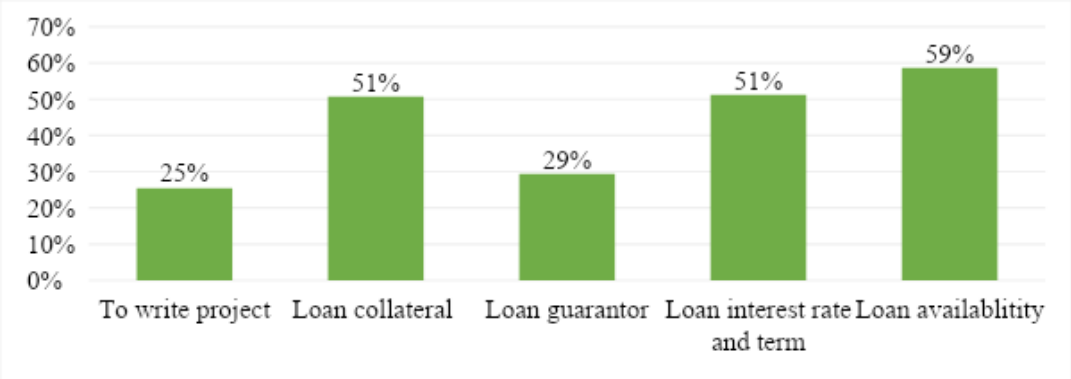
According to the results, MSME's expressed interest to obtain funding from subsidized government loans or grants from international donor organizations. From this, it can be concluded that entrepreneurs have knowledge and information about funding opportunities.

Figure 15. Evaluation of the financial sector



Source: Survey results

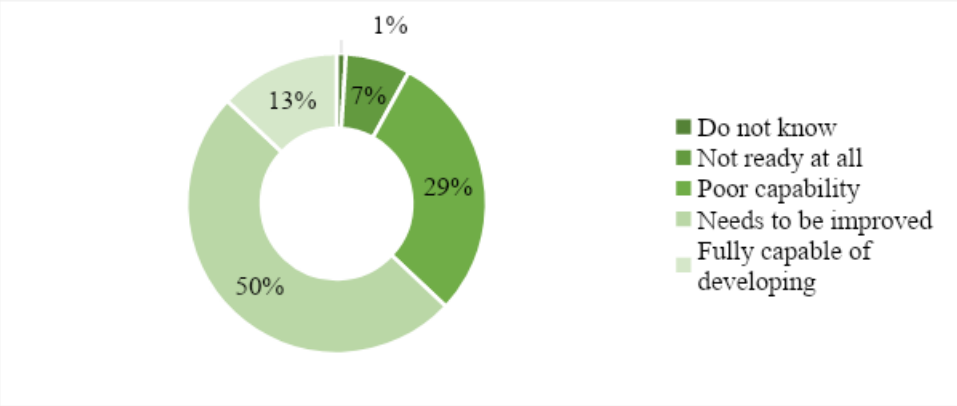
Figure 16. Challenges in obtaining financing



Source: Survey results

Among the challenges faced in doing environmentally friendly business, the answers to lack of investment (64% of all participants) and lack of economic and financial resources (58%) have the highest percentage (see section 2.4 of the report). 40% of farmers rated their financial capacity to introduce environmentally friendly practices as insufficient and 50% as necessary to improve. On the other hand, 21% of retailers were assessed as having financial capacity.

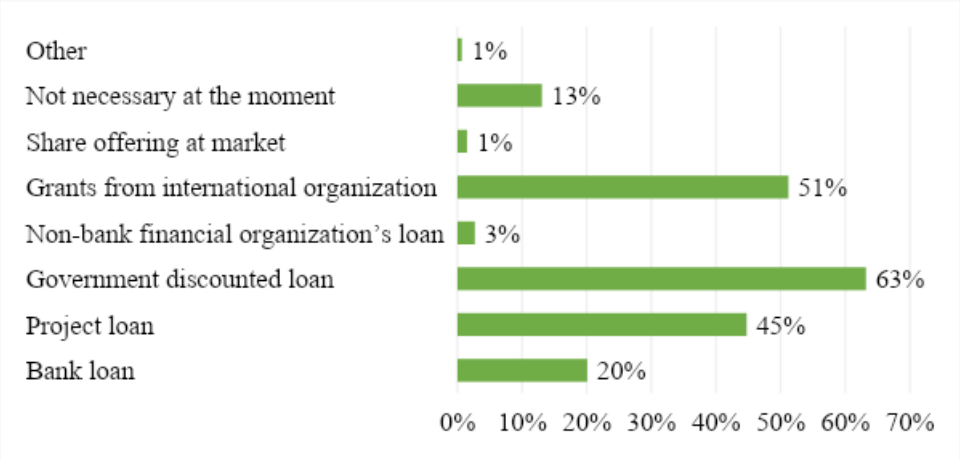
Figure 17. Self-assessment of financial capacity, on average



Source: Survey results

According to the results of the survey, MSMEs are interested in getting financing from the government concessional loans and international organization grants, as can be seen in the following figure.

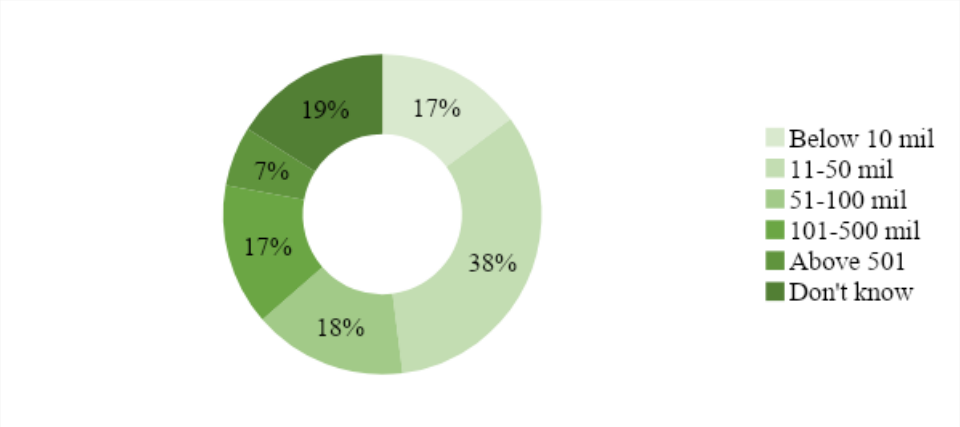
Figure 18. Funding source



Source: Survey results

17% of MSMEs need up to 10 million MNT, 38% 11-50 million MNT, and 18% 51-100 million MNT to implement the environmentally friendly activity. However, only 25% of all participants have project documents with the feasibility study for the development of green activities. Therefore, there is a high need for consulting and support services for project writing and the preparation of documents necessary for financing. 80% of all participants expressed their willingness to receive professional advice and services. In particular, it is concluded that it is necessary for beekeepers and farmers as a priority. Difficulties in obtaining financings, such as collateral and loan interest, are more related to the regulation of the financial sector in Mongolia, while MSMEs need to increase their project writing skills.

Figure 19. Amount of funding required



Source: Survey results

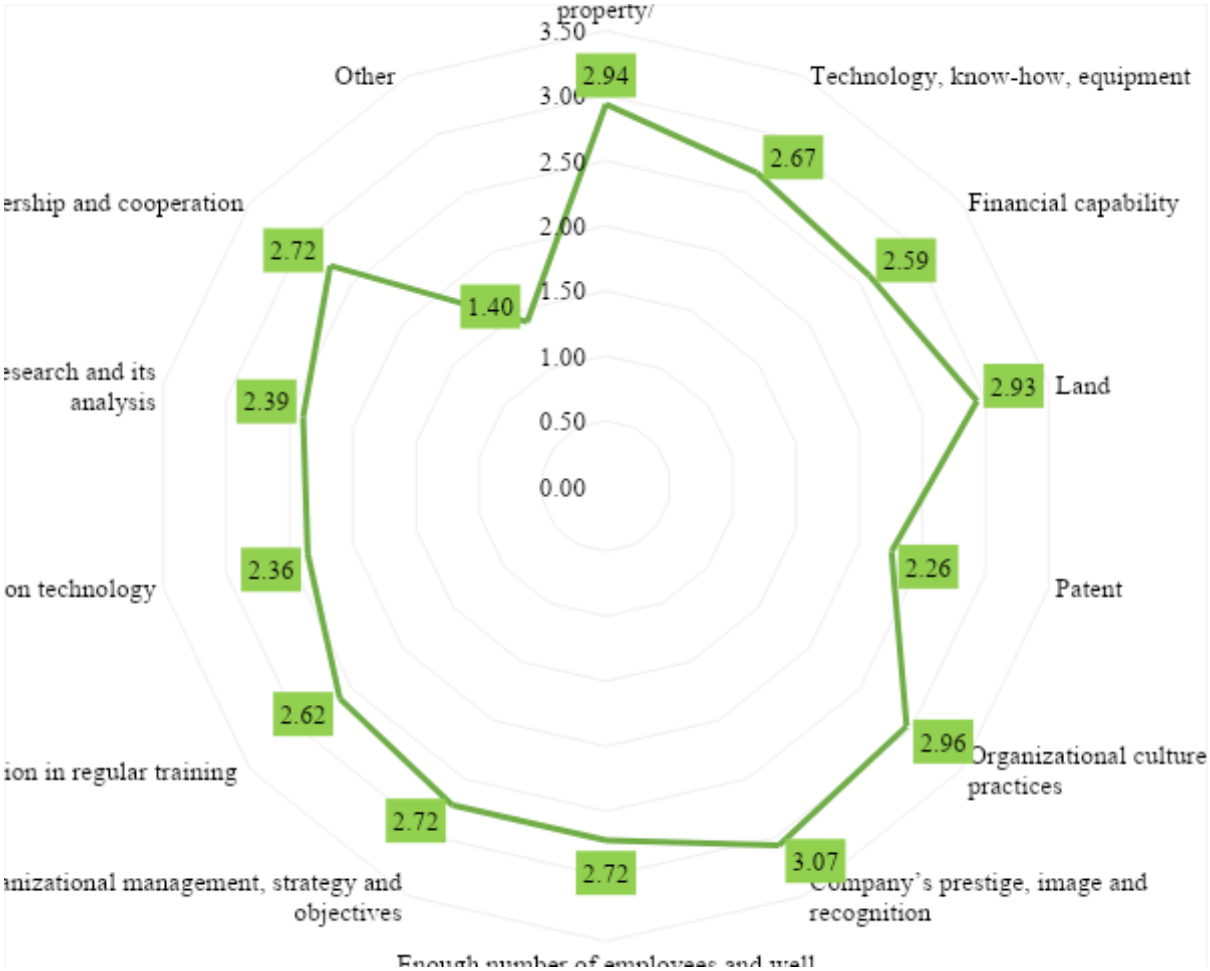
3.3. Capacities of MSMEs

In the self-evaluation questionnaire, digital, technological capacity, organizational capacity, goal setting, planning, policies, and implementation of implemented projects was evaluated on a 5-point Likert scale to introduce CE practices.

Digital capacity. Digital capacity and technological usage were evaluated by 1 question and 5 indicators. Overall, the digital capacity of entrepreneurs is insufficient, only 36% of respondents use digital technologies on a daily basis, and the majority do not use digital technologies yet. While 13% plan to use it in the future, the remaining 50% have no intention at all. At the same time, respondents who use technology, daily understand that it will increase productivity, save time, and introduce digital storage and online meetings into the business operation. Unfortunately, the half of respondents do not aware of it. The survey results show that MSMEs do not have practice working online from home. There were no differences in responses by geographic location. However, manufacturers, retailers, and food service companies are more digitized compared to other sub-sectors.

Organizational capacity. Organizational capacity was assessed with 1 question and 14 indicators, and respondents were selected from the proposed 5 responses, from “Not ready” to “fully capable”. The average value (mean) of the indicators is shown in the following graph. As can be seen from MSME’s self-assessment, they see the company image and organizational culture as strong, and the technology as the weakest point. There were no significant differences between geographic location and sub-sectors.

Figure 20. Organizational capacity



Source: Survey results

4. CIRCULAR ECONOMY PRACTICES

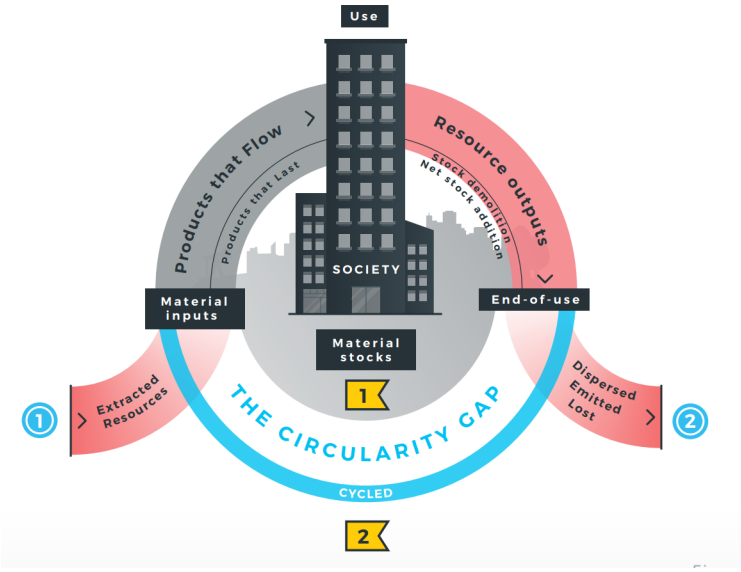
4.1. The concept of circular economy

The term "circular economy" refers to all operations that minimize the use of raw materials, maximize the usage of products and parts, and recycle materials during the production, distribution, and consumption phases[9]. The Circularity Gap Report 2022 shows evaluation of social and environmentally friendly activities, and the Mongolia is in the weakest position from 176 countries.[10]

4.1.1. The circular economy gap

A linear economy operates on a 'take-make-dispose' model, making unbounded use of resources to produce products that will be discarded after use. **A circular economy**, in contrast, centers around the reuse of products and raw materials, and the prevention of waste and harmful emissions to soils, water, and air, wherever possible**.**

Image 7. Circularity gap



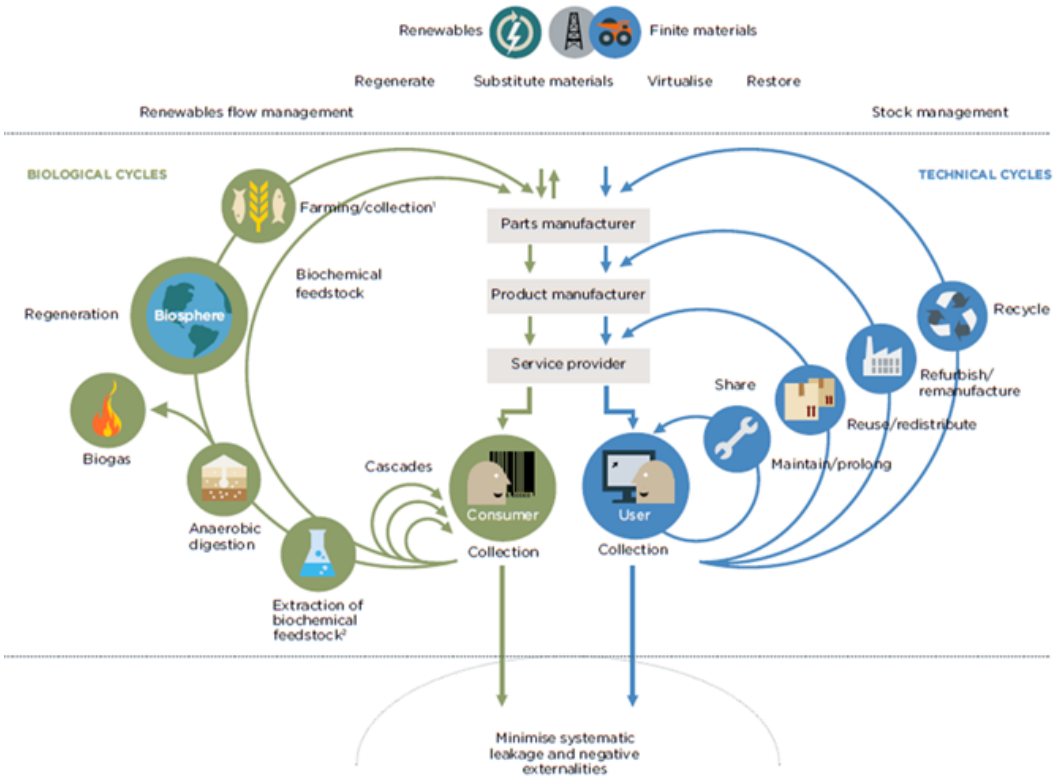
Source: A multiregional analysis of waste generation, recovery, and stock depletion in 2011

A circular economy distinguishes between technical and biological cycles:

1. **The technical cycle involves** the management of stocks of finite materials.
2. **The biological cycle** encompasses the flows of renewable materials. Consumption only occurs in the biological cycle. Renewable (biological) nutrients are mostly regenerated in the biological cycle.

Image 8. Outline of a Circular Economy

[9] Jouni Korhonen. Circular economy as an essentially contested concept
[10] Global Impact Organization, The Circularity Gap Report 2022.
https://circulareconomy.europa.eu/platform/sites/default/files/1._report_cgr_global_2022.pdf



Source: Source: Ellen MacArthur Foundation and McKinsey Center for Business and Environment; Adapted from Braungart & McDonough, Cradle to Cradle (C2C).

The circular economy rests on three principles.

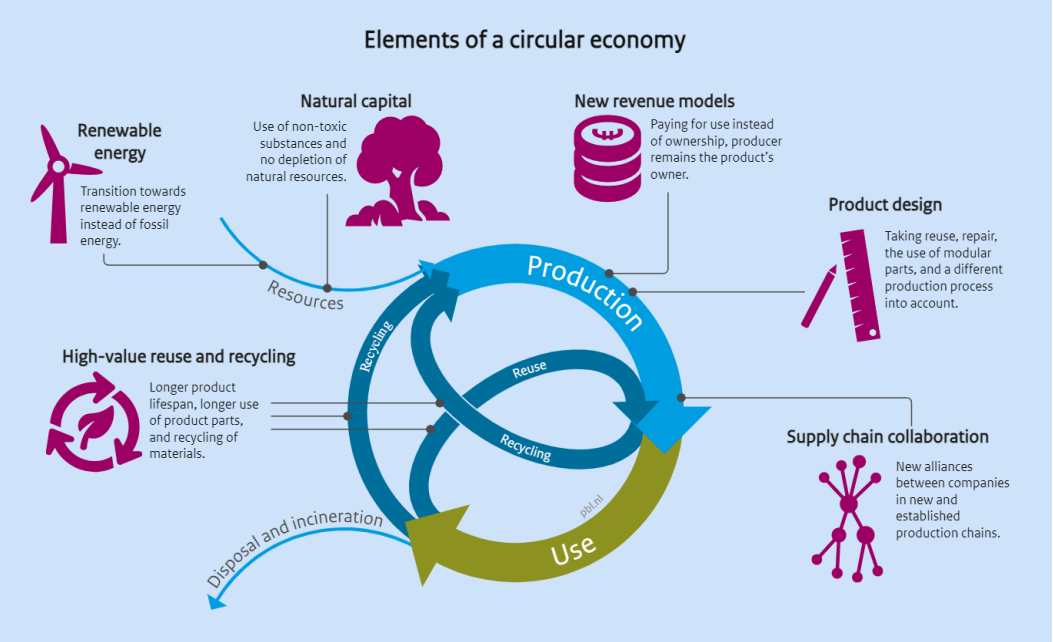
- **Principle 1:** Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows.
- **Principle 2:** Optimize resource yields by circulating products, components, and materials at the highest utility at all times in both technical and biological cycles. This means designing for remanufacturing, refurbishing, and recycling to keep technical components and materials circulating and contributing to the economy. In the biological cycle, products are designed to be consumed or metabolized by the economy and regenerate new resource value.
- **Principle 3:** Foster system effectiveness by revealing and designing out negative externalities. This includes reducing damage to systems and areas such as food, shelter, education, health, and entertainment, and managing externalities, such as land use, air, water pollution, and the release of toxic substances.

4.1.2. The element of circular economy

To close the loop of the economy it is essential to define elements of the economy. The producers are encouraged to use renewable energy and natural capital, introduce new revenue models in

their business, change product design, and most important strengthen supply chain collaboration[11].

Image 9. Elements of a Circular Economy

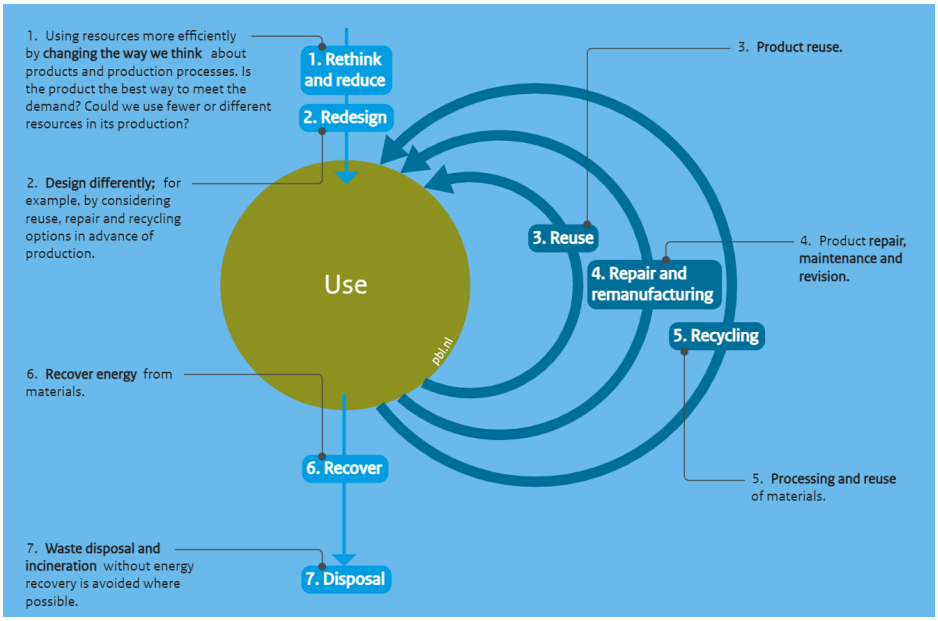


Source: Netherlands Environmental Assessment Agency

A circular economy is about more than recycling. NEAA defined strategies according to the 'Rs' (Rethink, Redesign, Reuse, Repair, Remanufacturing, Recycling, Recover).

[11] Opportunities for a circular economy - PBL Netherlands Environmental Assessment Agency

Image 10. Circular Economy strategy



Source: PBL Netherlands Environmental Assessment Agency

4.2. Current situation of circular economy practice

The results of the research are summarized in this section to identify the current situation and gaps in the circular economy study of MSMEs.

4.2.1. Strategy and Management practices in the Circular Economy

A total 742 entities participated in the study. It includes 444 entities of food production, beekeeping, farming, SMEs, and 298 entities that provide transportation, storage, and warehouse services.

In Mongolia, five standards are commonly used that are friendly to the environment, society and the economy. Of these, 12% implement the organic product eco-labelling standards of the MNCCI. 11% of entities follow the organic food certification mark of the MoFALI, while MNS 6737:2018 or Good Agricultural Practices (GAP) is followed by 11% of all participants. On the other hand, 17% of participants' implement ISO 22000 or food safety management systems (section 3.1.1 of the report). According to the results above, the level of adherence to standards is very low due to a lack of information about these standards, insufficient training and promotion, and insufficient participation of organizations that support their daily work. Because there is insufficient information about Mongolia's sustainable development goals, green development policies and plans, and other international projects, there is a great need to disseminate these programs to the public.

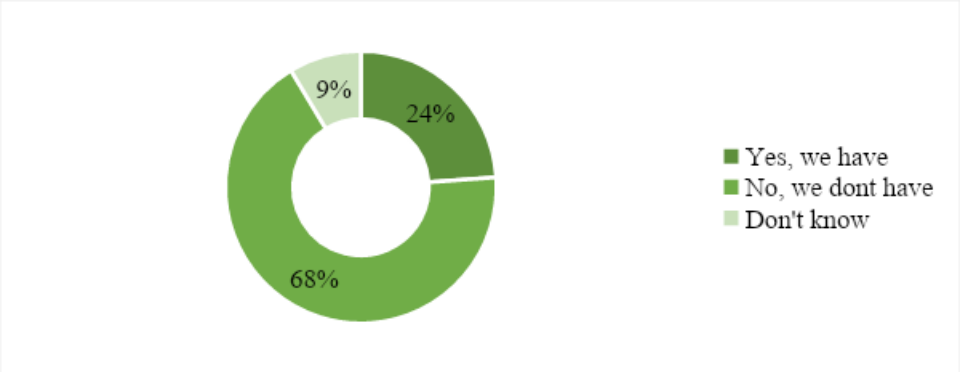
Table 17. Mongolia's adherence to environmental responsibility goals and objectives

№	Goals, programs	Q-ty	Percentage
1	Adherence to the sustainable development goals of Mongolia	275	38%
2	Implementation of Mongolia's green development policy and plans	242	33%
3	Integrated with international projects and programs	51	7%
4	Integrated with local projects and programs	99	14%
5	Non-adherent, non-integrated	302	42%

Source: Survey results

Entities with project plans aimed at developing and implementing environmentally friendly activities account for 24%, but this only aims to receive financial support, which indicates the weak financial capacity and high financial needs of micro, small and medium businesses.

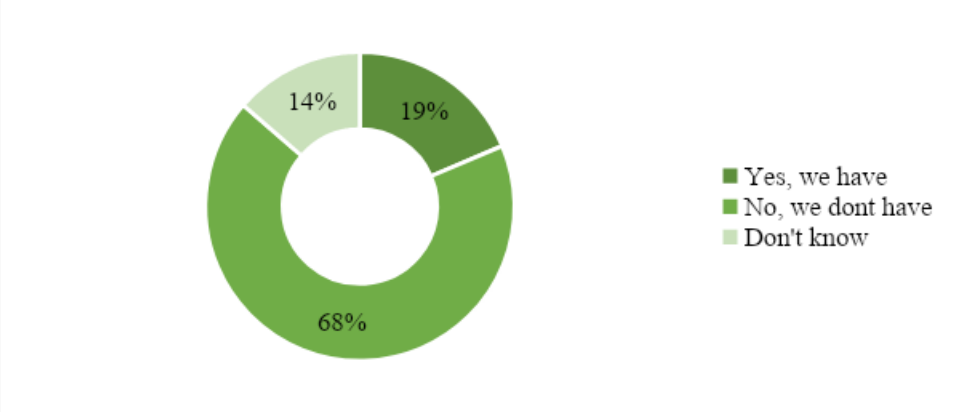
Figure 21. Eco project development status



Source: Survey results

At the same time, the lack of performance indicators to measure the implementation of the plan and circular economy practices is a weakness.

Figure 22. Indicators used to measure eco-goals



Source: Survey results

In particular: 18% of all respondents said that they only use indicators to measure eco-goals. On the other hand, 82% answered that there is no performance measure or they do not know, and the organization's strategic plan does not include the concept of circular economy and its goals.

Agricultural sub-sector. 229 farmers participated in the assessment of the current situation of circular economy practices. The fact that the implementation of "good agricultural practices" for farmers is higher than other standards (22.6%) can be explained by the sector's specificity. This means that organic practices related to soil management have been established, and there is ample scope for further good practice and adaptation. However, the indicators of being safe in the environment, participating in international projects supporting eco-practices, and joining national programs are insufficient. Also, the fact that they do not have a plan to introduce circular economy practices into their operations, and there is no performance indicator, shows that they have not set a goal to create circular economy practices.

Beekeeping sub-sector. Even though all 55 beekeepers have a good understanding of the organic product eco-labelling and the organic food certification mark of the MoFALI, only 11% of beekeepers have adopted the organic product eco-label of the MNCCI, and only 9% of beekeepers have received the organic food certification mark of the MoFALI. This is directly related to the process of obtaining the eco-label. The steps of obtaining the certificate are confusing, complicated, lacking information, time-consuming, and uncertain, causing difficulties for business owners. The weak ability of beekeepers to follow the standards also shows the weak development of the sector. The indicator of having a project plan aimed at the development and implementation of environmentally friendly activities is relatively high or 40%.

	Have a plan
Beekeeping	22 40%

This is due to the increase in beekeeping development micro-programs and local activities in the last 5 years. The efforts of beekeepers to operate safely in their environment are better than other sub-sector businesses.

Production sub-sector. 160 producers of food, water and beverage participated in the survey. In terms of experience in implementing national standards, producers fare well compared to other sub-sectors. But this is not a sufficient indicator. This is because, even though the understanding of the organic product eco-label of the MNCCI and organic food certification mark of the MoFALI is good, only 23.1% of producers have implemented the organic product eco-label of the MNCCI and 26.9% have obtained organic food certification mark of the MoFALI. As for good agricultural practices, 29.8% of the surveyed producers are following those practices. 24.8% of entities follow and operate a food safety management system. Entities that adhere to environmental safety and environmental management systems account for 29.3%. For producers, the level of compliance and implementation of standards is slightly higher than others, indicating that quality management systems and daily operations of end product manufacturers are well controlled.

When asked if there is a plan for the development and implementation of environmentally friendly activities, 30.6% answered that there is, 63.1% did not, and the remaining 6.3% did not know.

	Have a plan
Production	49
	30,6%

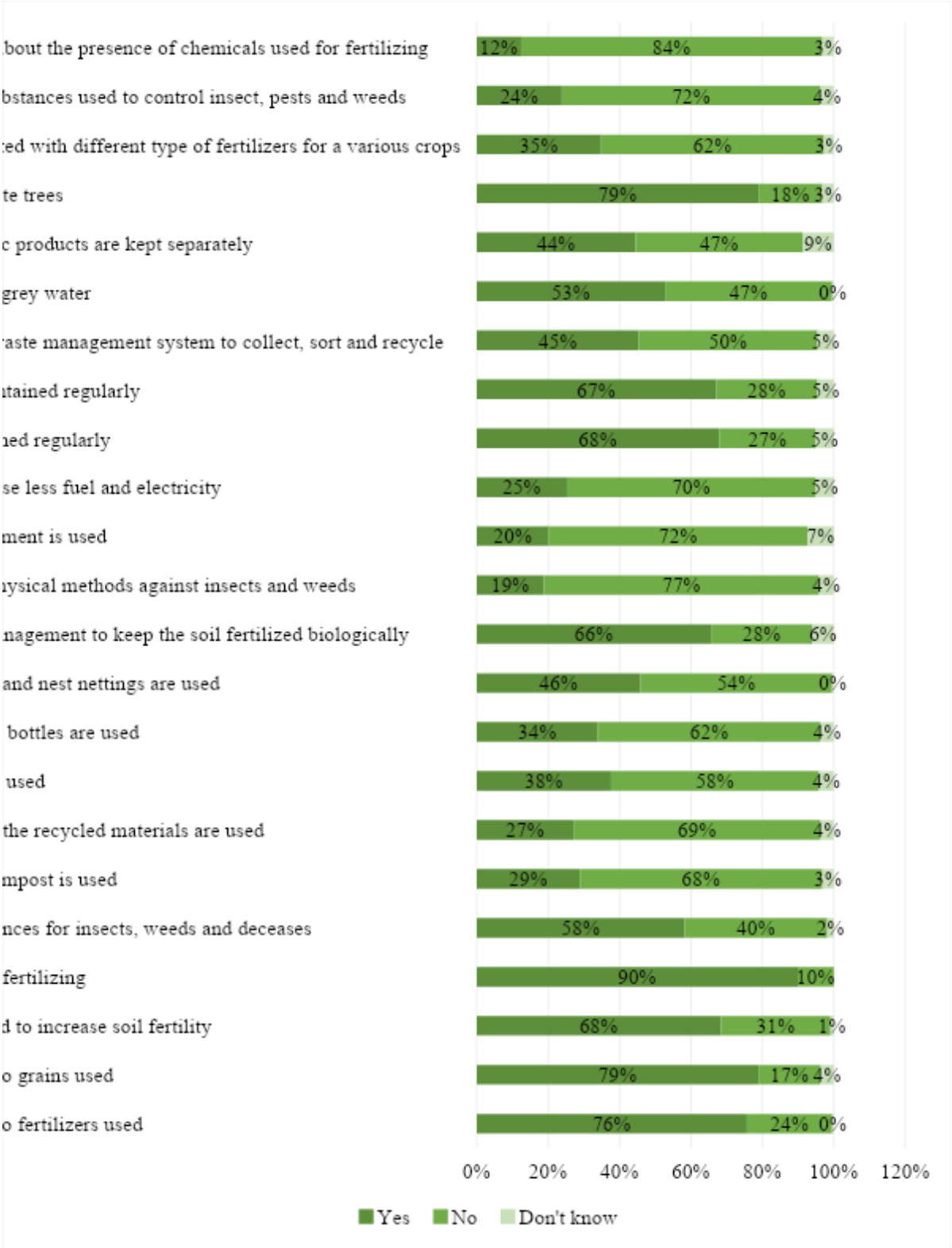
Retail sub-sector. Out of 298 retail trade and service provider organizations and individual entrepreneurs, who participated in the study, 140 retail trade, 110 food production and service providers, 21 warehouses and 23 transport service providers. For these entities, the experience of complying with the standards implemented in Mongolia is the weakest, and 31.5% have no understanding. This means that they have not paid much attention to the environment, eco-labelling and its importance; also there is a lack of information on this. Entities operating in the field of warehousing and transportation do not have plans for the development and implementation of environmentally friendly activities, and the fact that they do not know whether there are eco-projects or plans is because of the internal organization and strategic planning of the entity are unclear and lacks information.

4.2.2. Public and internal practices in the circular economy

Agricultural sub-sector. To determine the strengths, weaknesses and characteristics of each sub-sector, the 7R principles of circular economy practices were used, and MSMEs in the agricultural sub-sector were evaluated by 9 questions with 54 indicators. As a result of the study, farmers use natural fertilizers and animal manure to increase soil fertility. The performance of

soil management aimed at keeping the soil biologically active and fertile is good. Trees and plants near the agriculture area are regenerated, and equipment is regularly maintained and cleaned. The use of greywater and the use of renewable energy have not been adopted at all. Training on environmental safety, eco-production, and waste management is not regularly organized for employees. However, warehouse marking, product registration, use of fuel-efficient vehicles, energy-efficient equipment, and physical methods against pests and weeds are included in their activities. The use of recyclable, reusable, and recycled packaging, and the use of biodegradable packaging are very little practiced.

Figure 23. Circular economy practices of farmers

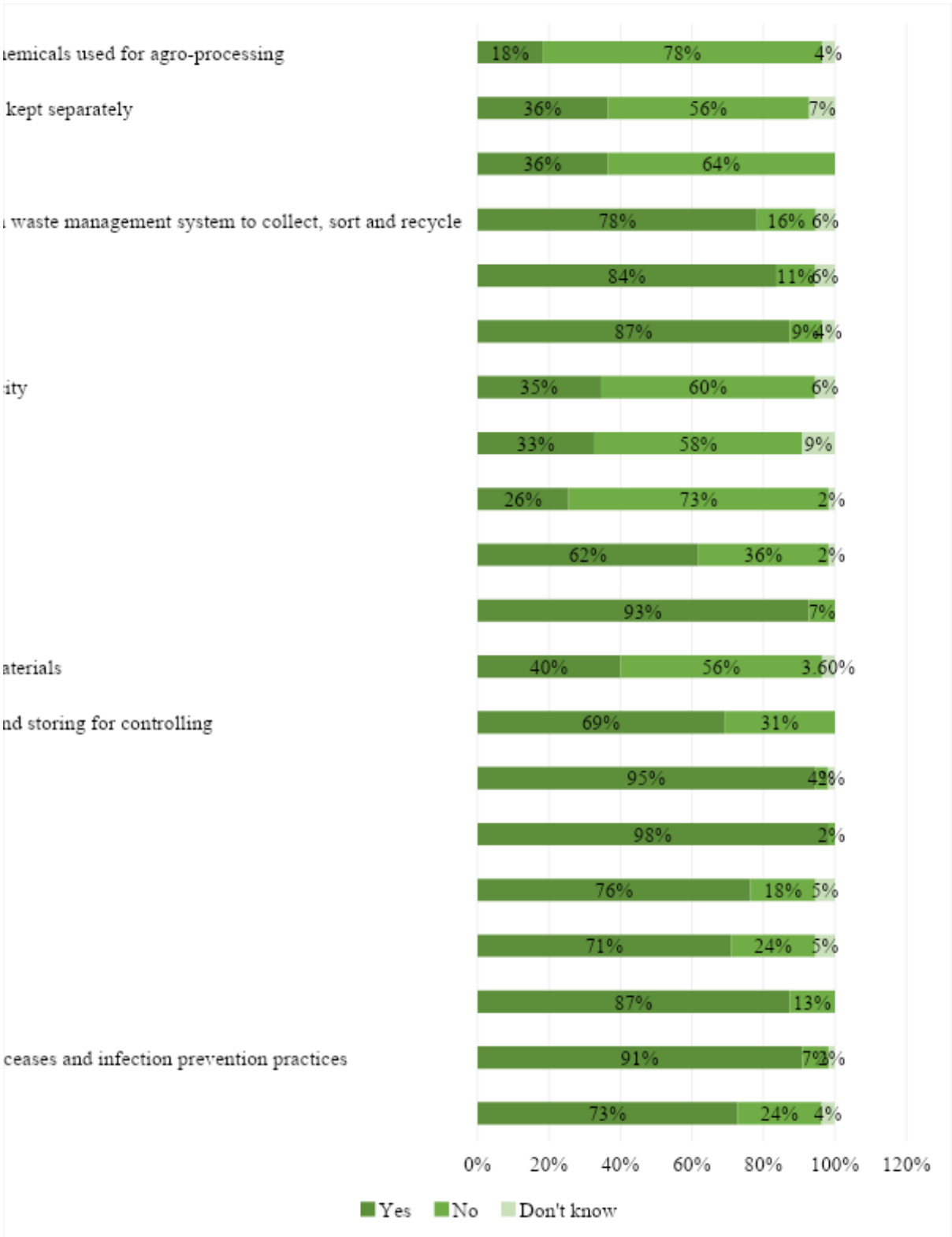


Source: Survey results

From this figure it can be seen that focusing on natural and capital resources and using fewer technological solutions in the cultivation and harvesting process is a weakness. One of the advantages is that farmers use the waste generated during the harvest as fertilizer, as animal feed, and the remaining part is used for landfilling. Unfortunately, the lack of activities to develop the collective economy, including the use of resources, technical assistance, and training, does not create conditions for obtaining information about the circular economy.

Beekeeping sub-sector. The circular economy experience of the beekeeping industry was evaluated by 9 questions with 51 indicators. The sector has developed rapidly in the last 5 years, and the number of beekeepers has increased, contributing to the creation of the concept of eco-products and eco-experiences among the general population. But beekeepers also focus more on product ingredients or reserves, and lack eco-experience in the production process and consumption stages. This can be seen in the following indicators. In particular, most beekeepers have hardy or resistant bee breeds, have suitable preventive measures against diseases and infections, use herbal treatment products, use natural materials to make beehives, use animal manure for fumigation, and regular cleaning, and regular maintenance of equipment.

Figure 24. Circular economy practices of beekeepers

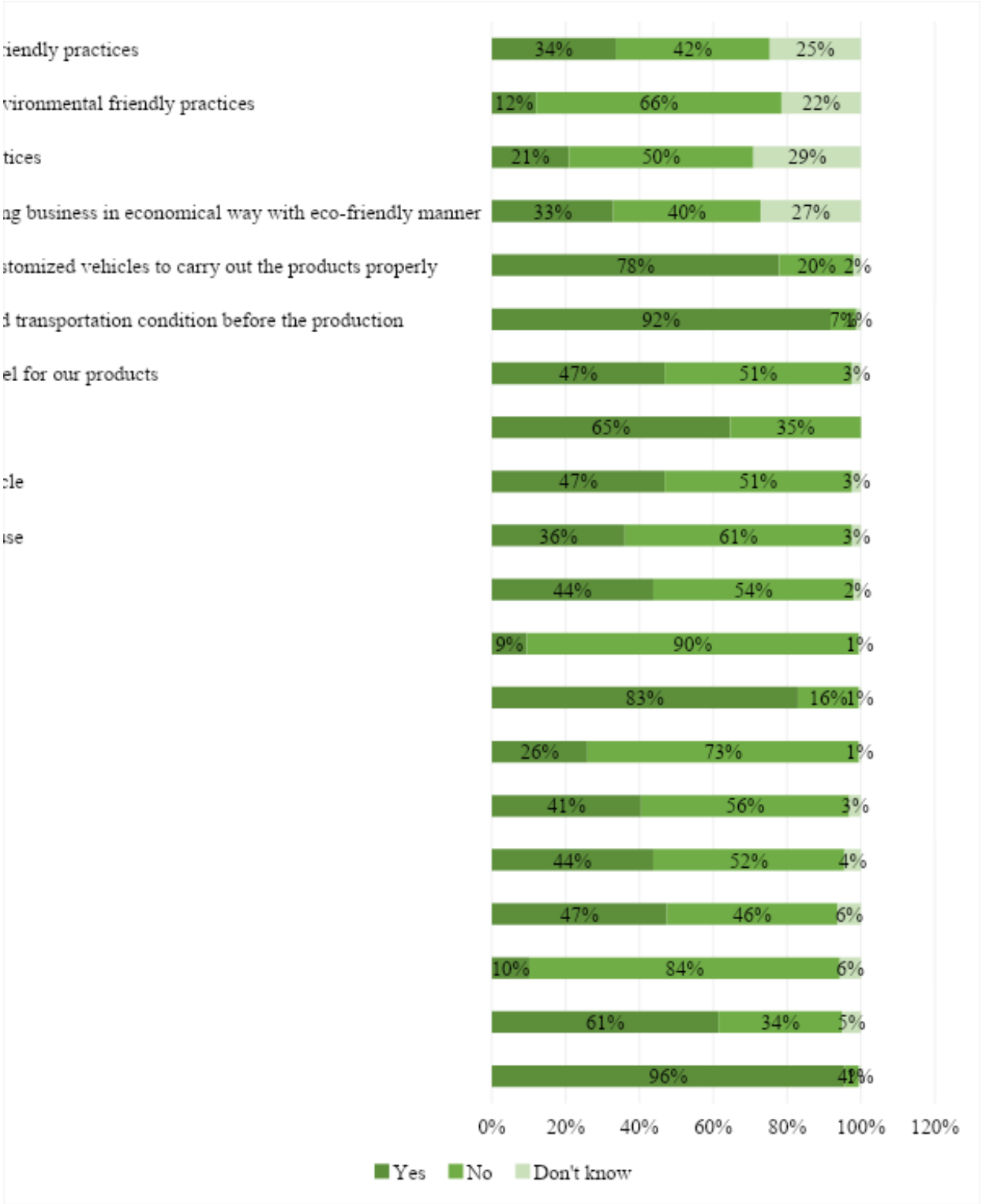


Source: Survey results

Some maintain regular beekeeping records and use recyclable containers and packaging. However, practices such as packaging made of recycled materials, product packaging take-back system, use of energy-efficient equipment, use of electric cars, rainwater and greywater, separate storage of chemical and organic products, and placement of warning signs about the presence of chemicals are low.

Production sub-sector. The circular economy practices of food and beverage producers were evaluated with 20 questions. They lack confidence that the businesses' operations will improve and opportunities will open up from the external environment by running environmentally friendly and economical activities. On the other hand, a product quality management system is good if the product's input, origin, verification, and transportation are permanently checked, storage and transportation records are kept, and transportation is carried out by special vehicles. It is the highest (96%) that it is customary to save water for consumption. Also, the practices of using equipment that consumes less energy and regularly conducting waste sorting and recycling training are good enough. However, special equipment and technology are not shared with other entities, and vehicles that use less electricity or fuel are not used. Also, it does not use packaging made from recycled materials, does not have a packaging take-back system, and does not use renewable energy. In the process of purchasing raw materials, even though the suppliers are required to have a laboratory quality assurance letter, as well as to have economic material packaging, they do not give priority to requirements that the equipment and products being purchased should use renewable energy sources, and system to take back waste/packaging from products and reuse them several times must exist. Among the most common practices implemented by producers within the framework of the principle of economic efficiency, there is a good tendency to work during night hours at discounted tariffs and to monitor water consumption.

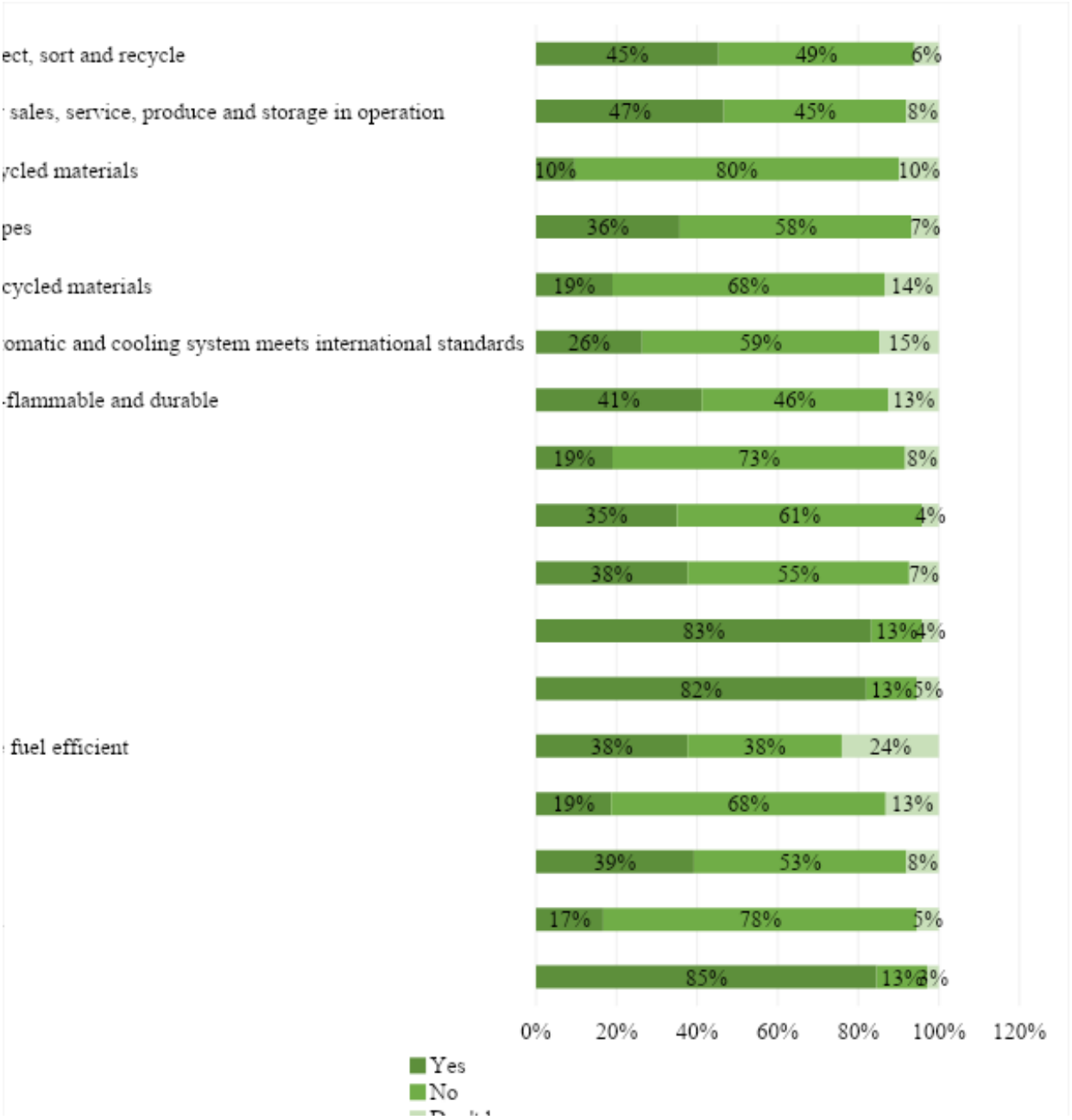
Figure 25. Circular economy practices of food and beverage producers



Source: Survey results

Retail trade and services sub-sector. 17 questions were evaluated under the 7R principles to determine the circular economy practices of retail, warehousing and transportation service providers. Regular maintenance of equipment, regular cleaning, and regular saving of water consumption were the practices with the highest indicators.

Figure 26. Circular economy practices of retail trade and service providers



Source: Survey results

Also, the practice of making warehouse floors, walls, and ceilings from fire-resistant materials, using low electricity consuming equipment, and regular training on waste sorting and recycling

are with average performance. However, practices such as sharing the special equipment and technology with other organizations, using vehicles that consume less electricity or fuel, using packaging made from recycled materials, taking back packaging, and using renewable energy are not enough.

4.2.3. The gap in circular economy practices

Based on the results of the survey, the following indicators have been evaluated and summarized how micro, small and medium business owners reflect the practices of the circular economy in the sub-sectors:

- Standards implemented in Mongolia
- Being responsible for the environment
- Policy documents for implementation of environmentally friendly activities
- Indicators for measuring objectives to environmental friendliness
- Cooperation

Table 18. The Gap in circular economy practices

№	The elements of circular economy	Agriculture	Beekeeping	Production	Retail
1.	Standards implemented in Mongolia	+	-	+	+
2.	Being responsible toward environment	-	-	+	+
3.	Policy documents for implementation of environmentally friendly activities	+	+	-	-
4.	Indicators for measuring objectives to environmental friendliness	-	-	-	-
5.	Cooperation	-	+	n/a	+

Source: Survey team

The table shows that the entities of the agriculture sector have a good project plan, which is a policy document aimed at the development and implementation of environmentally friendly farming, which indicates that there are relatively more opportunities for financing and concessional loans in the agricultural sector. It also adheres to national standards to a reasonable extent. For beekeepers, the experience of cooperation with other beekeepers is greater than in other sub-sectors. However, food and beverage manufacturers and retailers are actively

participating in environmentally friendly activities that adhere to national standards. However, none of the 4 sub-sectors use indicators to customize circular economy practices.

It is necessary to create a circular economy in the main activities of any organization including 1) smart selection of raw materials and eco-purchasing, 2) efficiency of the production process, 3) input, production, and output. Therefore, the current practices implemented by business organizations within the framework of the 7R principles have been evaluated and summarized in the table. By studying the practices of circular economy and eco-production, it is possible to see the level of opportunities for developing economical and environmentally friendly production in Mongolia, and in which areas the experience is insufficient and there are large gaps.

7R principle assessment of the Agricultural sub-sector

The circular economy practice of farmers is dominated by a pattern focused only on reserves.

Table 19. The Gap in circular economy practices of agriculture sub-sector

The Elements of CE	Refuse	Rethink /Redesign	Reduce	Reuse	Repair	Remanufacture	Recycle	Practices
Input	+							Natural organic and bio fertilizers used /14.1/
Input	+							Natural organic and bio grains used /14.2/
Input	+							Organic fertilizers used to increase soil fertility /14.3/
Input	+							Animal dung used for fertilizing /14.4/
Input	+							Natural organic substances for insects, weeds and diseases /14.5/
Input	+							Biodegradable and compost are used /14.6/

Process					+			Our equipment is cleaned regularly /14.15/
Process					+			Our equipment is maintained regularly /14.16/
Output/ usage			+					We use rainwater and grey water /14.18 /

Source: Survey team

Pros:

- The circular economy element that farmers are most focused on is the use of natural resources and their regeneration, fertilizing the soil with organic raw materials and rejecting environmentally harmful choices.

Cons:

- Unable to change accustomed to using the resources used in the planting and harvesting process efficiently, make the harvesting and planting process smarter, and change the business model and style to work by the market demand.
- Do not implement optimal resource management for re-engineering
- Poor practices for packaging made from reusable or recycled materials
- Do not use equipment that consumes less electricity or fuel

7R principles assessment of the Beekeeping sub-sector

Beekeeping is similarly reserve-focused and beginning to adopt eco-practices in its operations.

Table 20. The Gap in circular economy practices of beekeeping

The Elements of CE	refuse	Rethink /Redesign	Reduce	Reuse	Repair	Remanufacture	Recycle	Practices
Input	+							We have well tolerated bee breed /15.1/
Input	+	+						We have an appropriate method to combat diseases and infection prevention practices /15.2/
Input	+							We use organic honey and sugar syrup feeds /15.3/
Input	+							We are located within a 3km organic farming /15.4/

Input	+							Herbal medicine products are used /15.6/
Input	+							Natural materials are used to make beehives 15.7/
Input	+							Animal dung and manure smoke used /15.8/
Input	+							We keep records of beekeeping, processing and storing for controlling
Input				+				We use reusable packaging
Input				+				We use recyclable packaging
Process					+			We do our cleaning regularly
Process					+			We do our repairing services regularly
Output/ usage		+					+	Our company has a training for employees on waste management system to collect, sort and recycle

Source: Survey team

Pros:

- Make a wise choice of raw materials necessary for beekeeping and avoid raw materials containing chemicals as much as possible.
- Routine equipment maintenance, cleaning and in-house troubleshooting practices have been adopted.

Cons:

- No greywater or surface water is used
- Do not implement optimal resource management for re-engineering
- Do not use equipment that consumes less electricity or fuel
- There is no return/take-back system for packaging
- Do not extend product life for remanufacturing or using for other purposes

7R principles assessment of Production sub-sector

Even though manufacturers or producers have high requirements for the purchase of basic raw materials for products, they do not have enough practice of eco-practice in their operations.

Table 21. The Gap in circular economy practices of production

The Elements of CE	Refuse	Rethink /Redesign	Reduce	Reuse	Repair	Remanufacture	Recycle	Practices
Input			+					Our company promotes efficient water use /15.1/
Input	+							Our company usually checks on the origin of the ingredients, certification and transportation condition before the production /15.15/
Input	+		+					Bulk products or products with reduced amount of packaging /16.3/
Input	+							Equipment and technology with highest energy efficiency /16.5/
Input	+							Products with obligation to repair with no additional cost /16.7/
Input	+							Products and raw materials with certificate of good quality from laboratory /16.8/
Production			+					Our company uses low energy consumption equipment /15.2/
Production			+					Nighttime energy consumption at discounted rate /22/
Production					+			We do our repairing services internally for equipment /15.8/
Production							+	We have training on waste management system /15.12/
Production		+						Our company keeps the records of the storage and transportation and uses customized vehicles to carry out the products properly /15.16/

Source: Survey team

Pros:

- A system has been established to control and save the proper use of water and electricity

- Routine equipment maintenance, cleaning and in-house troubleshooting practices have been adopted.

Cons:

- Do not use renewable energy sources and do not use greywater
- Do not use packaging made from biodegradable or recycled materials
- There is no return/take-back system for packaging
- Do not extend product life for remanufacturing or using for other purposes
- Do not implement optimal resource management for re-engineering
- Boards and flyers promoting energy-efficient use are not placed in the workplace
- Do not fully understand the benefits to the organization from engaging in environmentally friendly activities

7R principles assessment of Retail trade and service sub-sector

In terms of retail trade, transportation, and warehousing services, the adoption of eco-practice in their operations is insufficient.

Table 22. The Gap in circular economy practices of retail

The Elements of CE	Refuse	Rethink /Redesign	Reduce	Reuse	Repair	Remanufacture	Recycle	Practices
Process			+					Our company promotes efficient water use /14.1/
					+			Our equipment is maintained regularly /14.6/
					+			We use packaging made from recycled materials /14.7/

Source: Survey team

Pros:

- A system has been established to control appropriate water consumption and conservation
- Routine equipment maintenance, cleaning, and in-house troubleshooting practices are in place.

Cons:

- Do not use renewable energy sources and do not use greywater
- Do not use low fuel consumption or electric vehicles

- Storage and service areas are not landscaped with recycled materials
- Do not meet requirements for fire resistance and environmental friendliness
- There is no return/take-back system for packaging

According to the analysis of the current conditions of circular economy practices and daily operational practices of micro, small and medium businesses in the food, water, and beverage industry in the food and agriculture industry, when the requirements for suppliers of raw materials are high, the tendency to reject items that are harmful to the environment and not economical is very high and the 7R's refuse practice is sufficient. The ability to rethink the production process of each sub-sector, to meet the needs of consumers, to adapt to the social environment, and to redesign products /rethink, redesign/ is insufficient. However, reducing practices are being practiced in entities by saving water only to the extent that they can, and using more electricity at night. In other words, there is no saving process supported by external activities, organizations, and stakeholders. There is no reuse mentality, and the life cycle of the product is not extended by reusing or changing its use. Organizations have a good track record in repairing damage caused during internal operations and regularizing equipment maintenance. It can be said that the practice of remanufacturing is not there in sub-sectors. Study results show that recycling practices are the most talked about topics in society, but there is a lack of implementation processes and only at the level of training and research.

5. VALUE CHAIN

5.1. Value chain analysis

The analysis of the value chain was carried out by sub-sectors: agriculture, beekeeping, food and beverages production, retail, and a map of the value chain was created.

5.1.1. Value chain analysis of Agriculture

Most of Mongolia's agricultural products are grains. It can be seen from the following table that the amount of fruit and berry cultivation is very low in the country.

Table 23 Amount of harvest, tons

№	Type	2017	2018	2019	2020	2021
1	Grains	238,101.90	453,849.20	433,305.40	430,317.90	614,497.20
2	Potato	121,808.50	168,882.60	192,239.90	244,261.60	182,638.20
3	Vegetable	82,102	100,731.70	99,546.60	121,235.10	121,743.40
4	Crop feed	47,894.90	123,839.90	121,117.20	182,090.50	293,676.30
	Total	489,907.30	847,303.40	846,209.10	977,905.10	1,212,555.10

Source: 1212.mn

Table 24. Amount of fruits and berries harvested, tons

№	Type	2017	2018	2019	2020	2021
1	Sea buckthorn	1,189.12	1,397.11	1,512.47	1,331.41	2,060.28
2	Ranetka	50.99	50.37	37.72	188.25	12.31
3	Gooseberry	176.42	196.34	193.28	2.64	218.77
4	Blackberry	2.81	1.83	1.79	1.36	1.02
5	Others	53.38	46.46	39.02	5.74	64.26
	Total	1,472.72	1,692.10	1,784.27	1,529.40	2,356.64

Source: 1212.mn

The majority of the population's food products are food products of agricultural origin. Compared to the annual needs of the total harvest, it is possible to fully meet the needs of cereals and potatoes. However, there is no cultivation to meet the needs of fruits and vegetables.

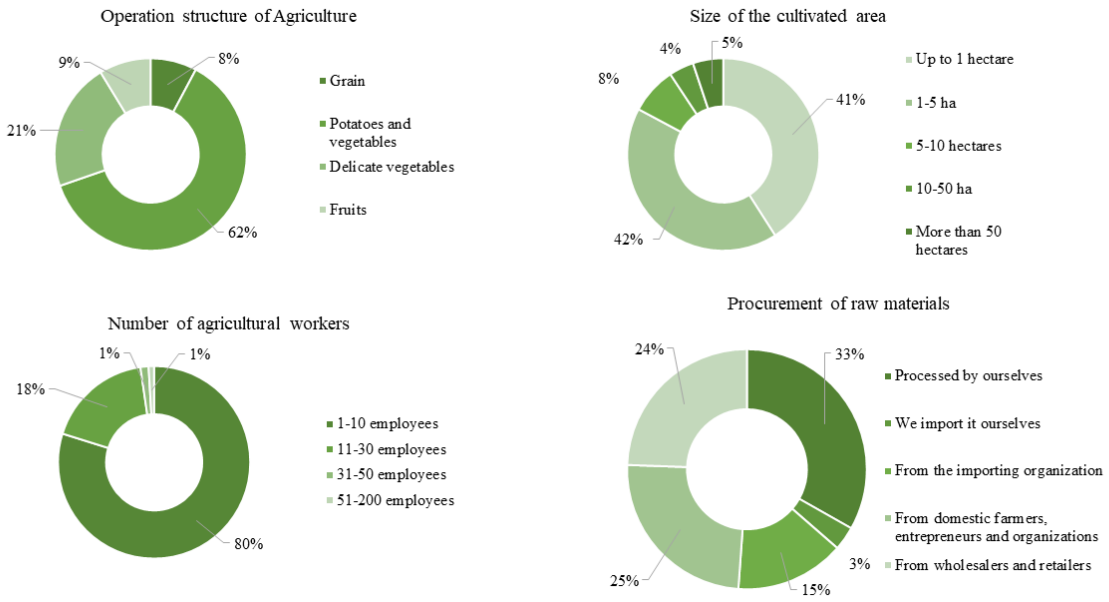
Table 25. Amount of food products for the population, thousand tons

№	Type	2016	2017	2018	2019	2020
1	Meat and meat products	172.6	176.2	178.7	179.2	182.4
2	Milk	145.3	148.4	150.5	150.9	153.6
3	Dairy product	163.5	166.9	169.3	169.7	172.8
4	Flour	90.8	92.7	94.1	94.3	96
5	Bakery products	163.5	166.9	169.3	169.7	172.8
6	Variety of rice	45.4	46.4	47	47.1	48
7	Sugar and sugar products	30	30.6	31	31.1	31.7
8	Potato	109	111.3	112.9	113.2	115.2
9	Vegetable	236.1	241.1	244.6	245.2	249.6
10	Fruit	181.6	185.5	188.1	188.6	192
11	Legumes	36.3	37.1	37.6	37.7	38.4
12	Egg	18.2	18.5	18.8	18.9	19.2
13	Vegetable oil	20.9	21.3	21.6	21.7	22.1

Source:1212.mn

From the results of the assessment, the value chain of agricultural producers consists of the stages of input, processing, output or distribution. The agricultural products prepared by the farmers account for 8% of grains, 62% of potatoes and vegetables, 9% of delicate vegetables, and the remaining 8% accounts for fruits. Farmers are classified as Micro, Small, and Medium Enterprises, whereas 80% are micro, 19% are small, and 1% are medium enterprises based on the number of employees. 41% of the farmers have up to 1 hectare, 42% have 1-5 hectares, 8% have 5-10 hectares, 4% have 10-50 hectares, and the remaining 5% have more than 50 hectares of land. 89% of the farmers own the land, but 10% are renting the land. Some of the results of the analysis carried out in the circular economy practice section (Chapter 4) show that 53% use rainwater and greywater, 79% use natural organic seed, 76% use natural organic fertilizer, 58% use natural organic substances to prevent pests, weeds and diseases, 20% use energy-efficient equipment, 38% use reusable materials, 34% use recyclable materials and 27% use recycled materials. 80% of the farmers have 1-10 employees; the remaining 18% have 11-30 employees. 33% of organic fertilizers, seeds, feed and substances are processed by themselves, 25% buy from domestic enterprises, 24% buy from wholesalers and retailers, and 15% buy from importers.

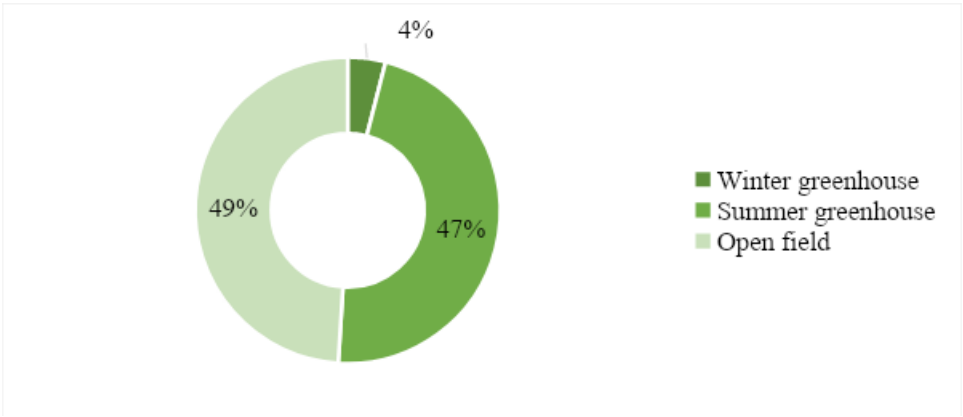
Figure 27. Inputs of the farmers



Source: Survey results

49% of the farmers grow their products on open land, 46% have summer green houses and 4% have winter greenhouses. Some of the results of the analysis carried out in the circular economy practice section (Chapter 3.6) show that 68% regularly clean the equipment, 67% repair and make service maintenance of their equipment, while vegetables and fruits are stored in cellars and grains stored in common storage.

Figure 28. Types of farming (Agronomy types)



Source: Survey results

7.8% of the farmers implemented the Organic product/certified organic eco-label of MNCCI, 8.3% have MNS 6737:2018 Good Agricultural Practices, 6.5% implemented the Organic food certificate of MoFALI, 9.6% implemented ISO 22000 Food safety management system and 6.5% implemented ISO 14001 Environmental Management system.

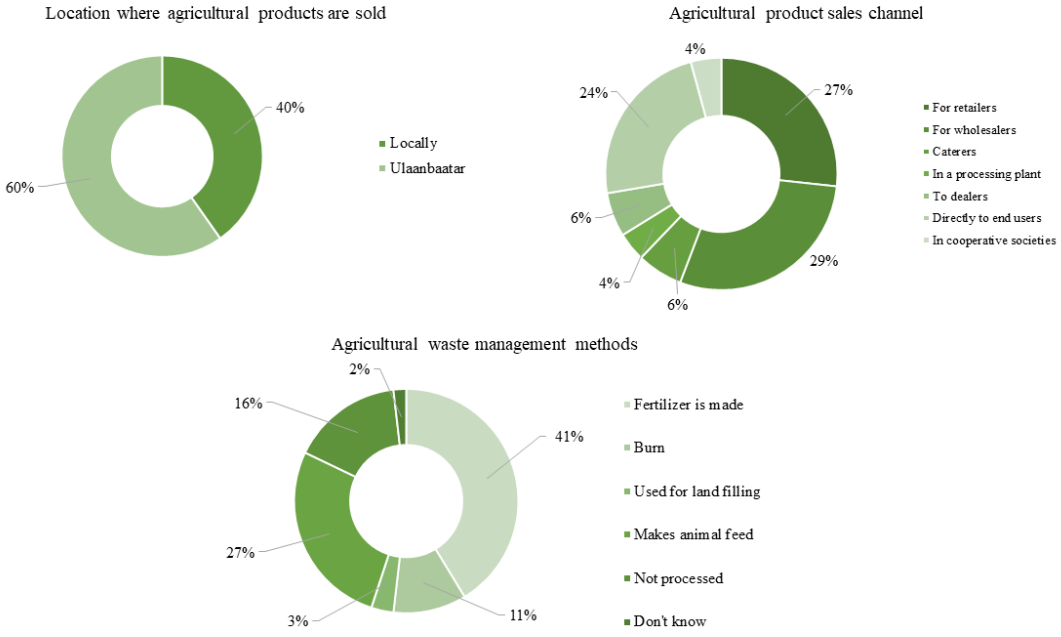
Table 26. Agricultural green certification status

		Not heard of these	No, it is not planned	No, but it is planned	Yes, early stages of implementation	Yes, it has been implemented	Total
The Organic product/certified organic eco-label of MNCCI	Q-ty	27	75	99	10	18	229
	%	11.79%	32.75%	43.23%	4.37%	7.86%	100.00%
Organic food certificate of the MoFALI	Q-ty	28	81	95	10	15	229
	%	12.23%	35.37%	41.48%	4.37%	6.55%	100.00%
MNS 6737:2018 Good Agricultural Practices	Q-ty	35	68	97	10	19	229
	%	15.28%	29.69%	42.36%	4.37%	8.30%	100.00%
ISO 22000 Food safety management system	Q-ty	30	64	100	13	22	229
	%	13.10%	27.95%	43.67%	5.68%	9.61%	100.00%
ISO 14001 Environmental Management system	Q-ty	33	73	97	11	15	229
	%	14.41%	31.88%	42.36%	4.80%	6.55%	100.00%

Source: Survey results

60% of the products are being sold in Ulaanbaatar city and 40% in the rural area. 27% is sold to retailers, 29% to wholesalers, 24% to direct end users, 6% to food service providers, 6% to intermediaries, 4% to processors, and 4% to cooperatives. Whereas, there is no export at all. 41% of agricultural waste is composted, 27% is used as animal feed, 11% is incinerated, 3% is used for landfills, and the remaining 16% is thrown away.

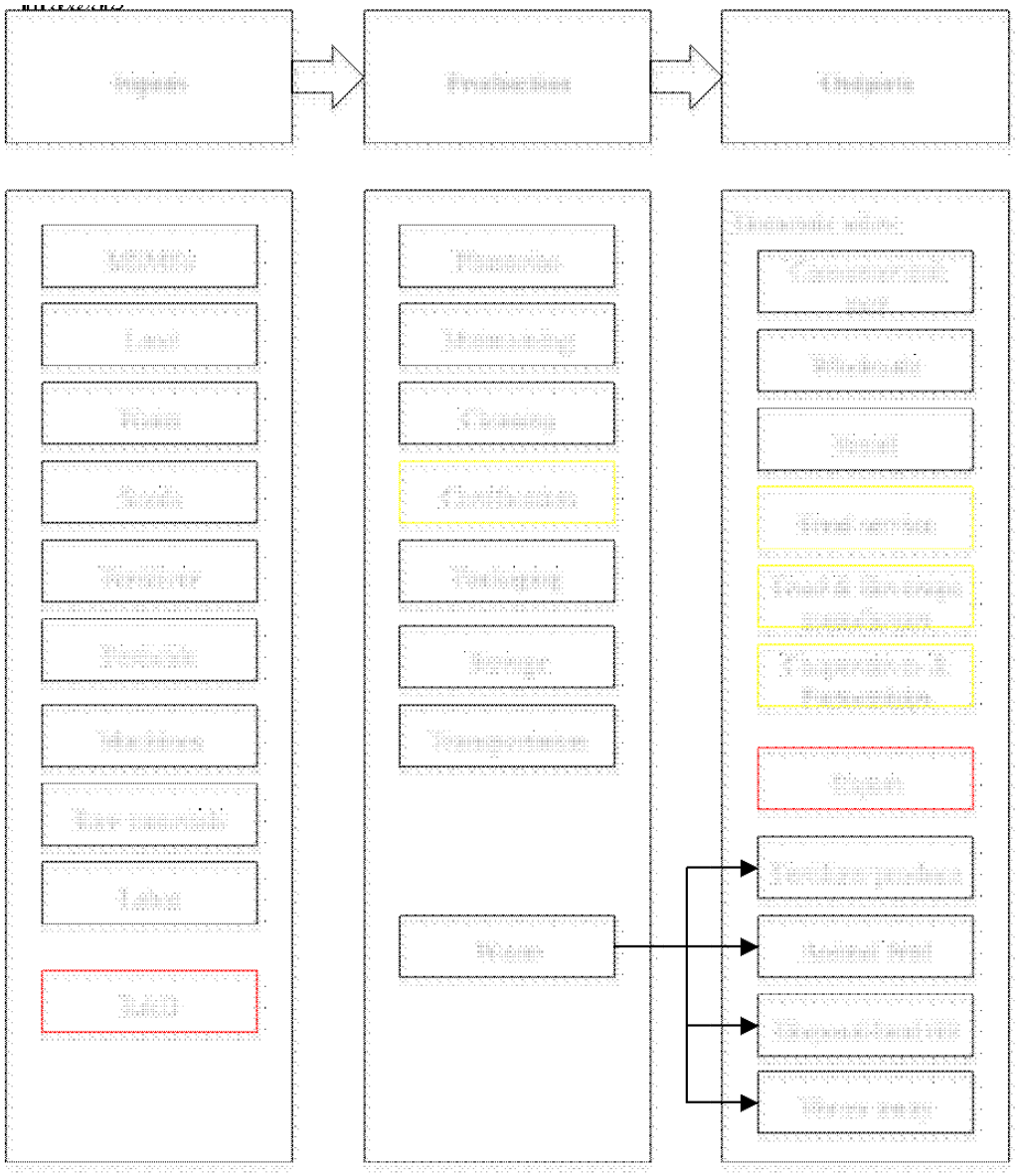
Figure 29. Agricultural output



Source: Survey results

Based on the above analysis, the value chain is mapped as follows. The picture shows that the status of obtaining Agriculture and organic certification is insufficient for farmers, research and development have not been conducted and the number of sales channels are limited, and the farmers mostly sell their products to wholesalers. There is a disadvantage of not exporting the products at all.

Image 11. Agriculture value chain mapping



Source: Survey team

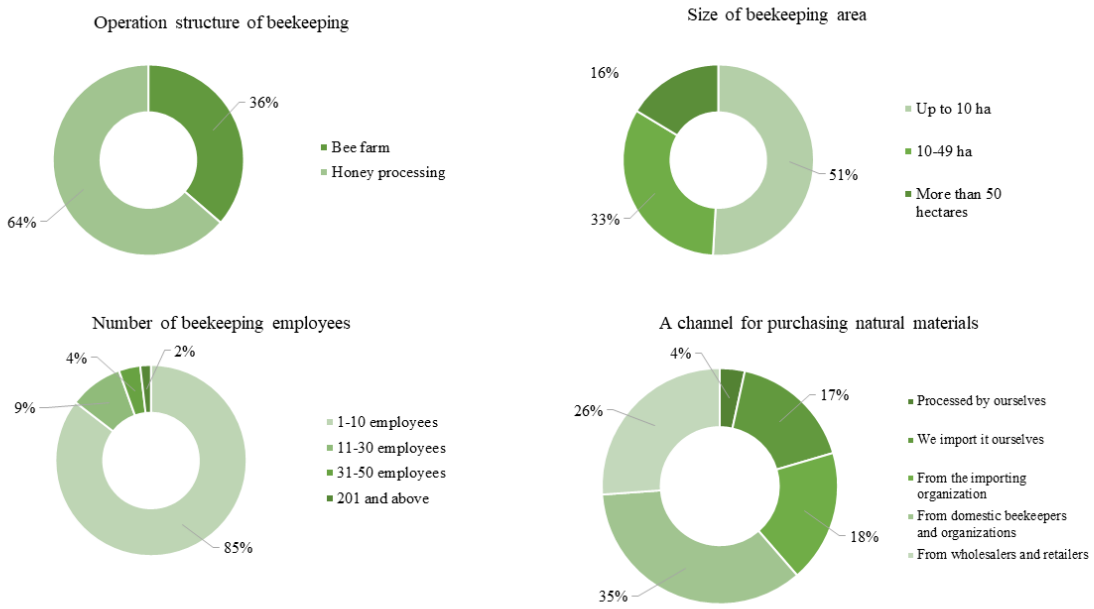
5.1.2. Value chain analysis of Beekeeping

36% of beekeepers breed bees and 64% process honey. 85% of the self-assessment, 13% small, and 2% medium producers. 51% of beekeepers use up to 10 hectares, 33% from 10 to 49 hectares, and 16% from more than 50 hectares of land.

Some of the results of the analysis carried out in the CE practice section (Chapter 4) show that 36% use rainwater and greywater, 33% use energy-efficient equipment, 95% use natural and organic materials, 93% use reusable materials, 62% use recycling materials for utilization and 40% use recycled materials.

85% of the beekeepers have 1-10 employees, 9% have 11-30 employees and the remaining 6% have more than 31 employees. 35% of natural and organic materials are bought from domestic beekeepers and organizations, 26% from wholesalers and retailers, 17% imports them themselves, and 18% buy the materials from importing organizations. They do small research and development, but the training of the employees of the organizations is done regularly.

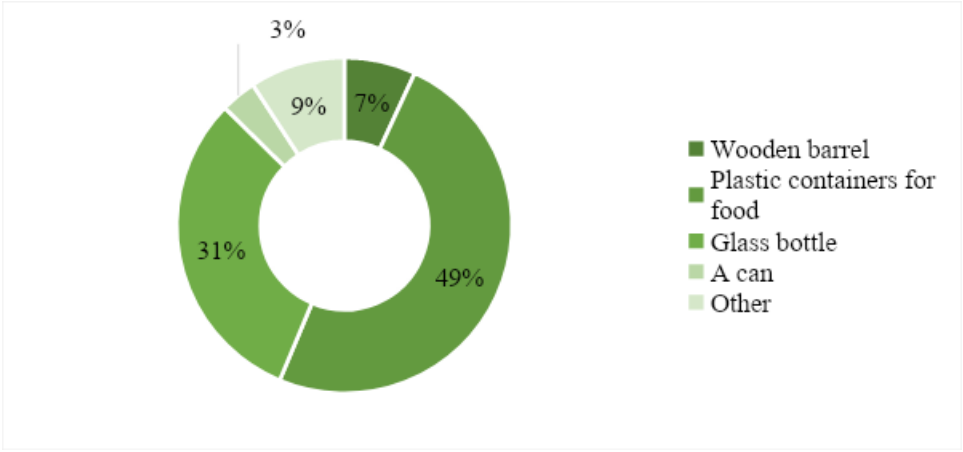
Figure 30. Beekeeping inputs



Source: Survey results

Beekeeping consists of breeding, harvesting, storing, processing and packaging. Regular cleaning of equipment is done by 87% and maintenance of equipment is done by 84%. 49% of honey is stored in wooden barrels and 31% in glass containers.

Figure 31. Methods of storing bee honey



Source: Survey results

12.7% of the Beekeepers implemented the Organic Food Certificate of the MoFALI, 18% implemented Good Agricultural Practices, 10.9% implemented ISO 22000 Food Safety Management System, and 10.9% implemented ISO 14001 Environmental Management System.

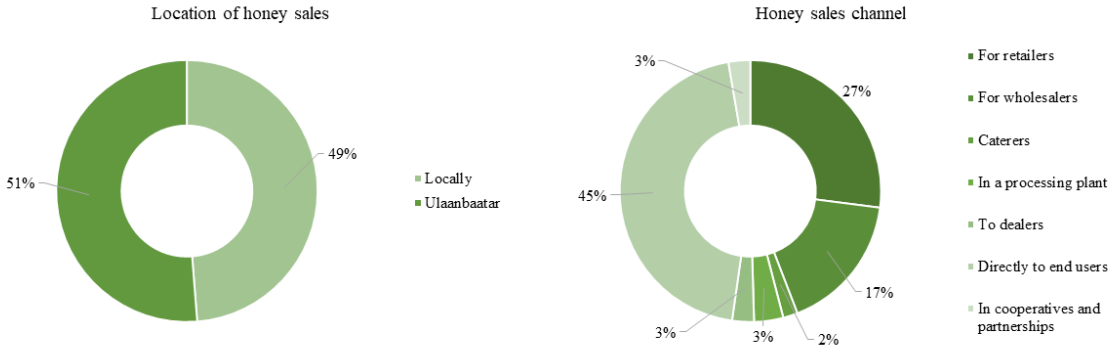
Table 27. Beekeeping green certification status

		Not heard of these	No, it is not planned	No, but it is planned	Yes, early stages of implementation	Yes, it has been implemented	Total
The Organic product/certified organic eco-label of MNCCI	Q-ty	2	12	30	1	10	55
	%	3.64%	21.82%	54.55%	1.82%	18.18%	100.00%
Organic food certificate of the MoFALI	Q-ty	2	12	32	2	7	55
	%	3.64%	21.82%	58.18%	3.64%	12.73%	100.00%
MNS 6737:2018 Good Agricultural Practices	Q-ty	8	8	25	4	10	55
	%	14.55%	14.55%	45.45%	7.27%	18.18%	100.00%
ISO 22000 Food safety management system	Q-ty	7	9	26	7	6	55
	%	12.73%	16.36%	47.27%	12.73%	10.91%	100.00%
ISO 14001 Environmental Management system	Q-ty	7	12	25	5	6	55
	%	12.73%	21.82%	45.45%	9.09%	10.91%	100.00%

Source: Survey results

51% of the products are sold in Ulaanbaatar, 49% in the rural areas. 27% to retailers, 17% to wholesalers, 45% to direct end users, 2% to food service providers, 3% to intermediaries, 3% to processing plants, 3% to cooperatives. There is no export at all, it is a production with almost no waste.

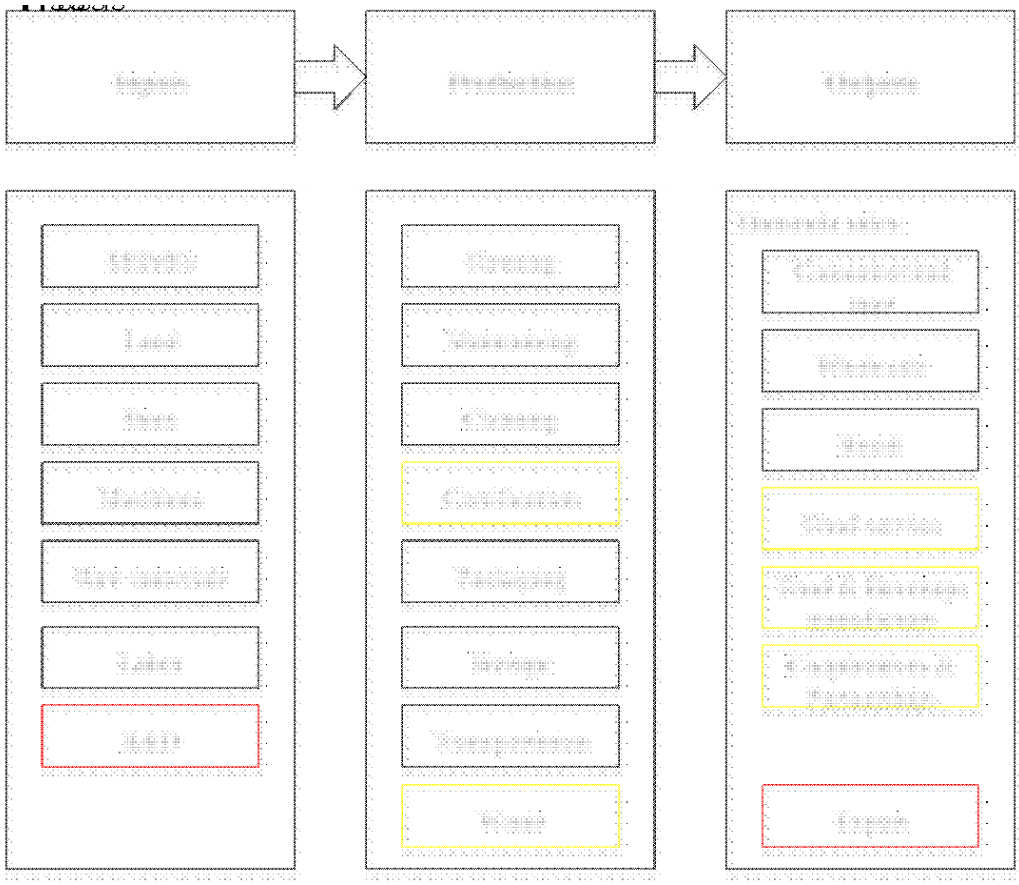
Figure 32. Beekeeping outputs



Source: Survey results

Based on the analysis of the value chain of beekeeping, it can be seen that there is very little green certification and insufficient research. Beekeeping is characterized by low waste. However, beekeeping has the same disadvantages as agriculture in that the channels for selling finished products are mainly retail, wholesale, and direct to end consumers. There is also no export at all.

Image 12. Beekeeping value chain mapping

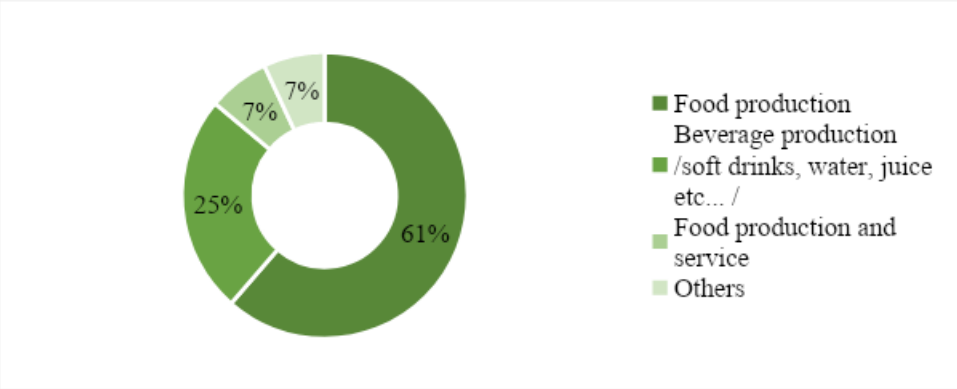


Source: Survey team

5.1.3. Value chain analysis of the Food and beverage industry

61% of food and beverage production is food production, 25% is water and beverage production, and 7% is food production.

Figure 33. Food and beverage production activities



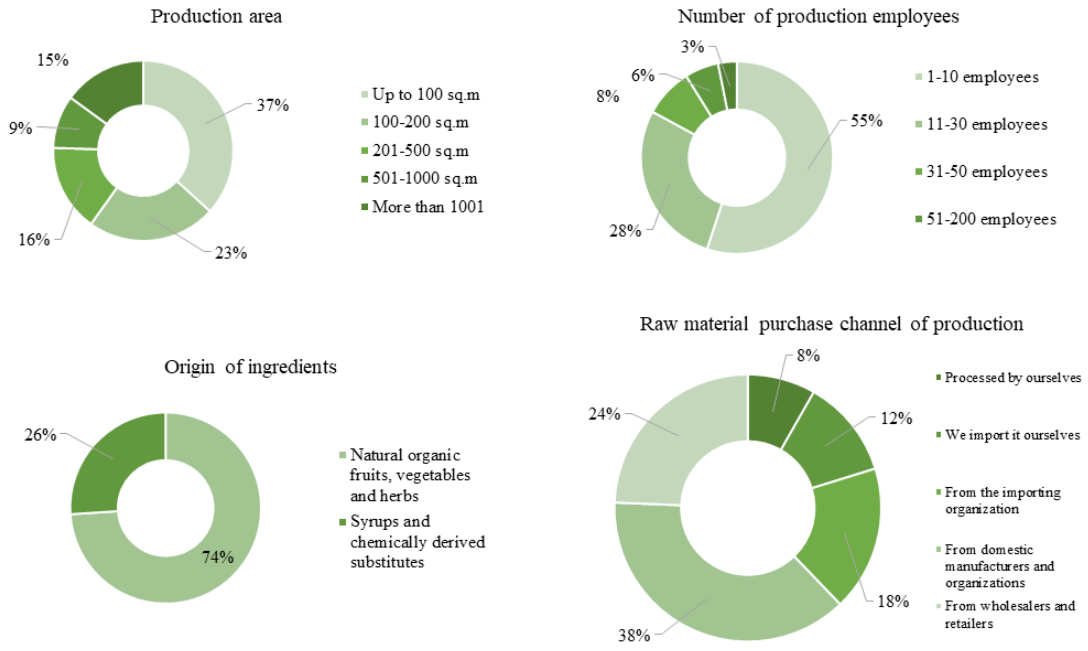
Source: Survey results

55% of food and water producers are micro, 36% are small, and 6% are medium producers. 37% produce their products in an area of 100m2, 23% from 101 to 200m2, 16% from 201 to 500m2, 10% from 501 to 1000m2 and the remaining 15% in an area more than 1001m2.

Some of the results of the analysis carried out in the CE practice section (Chapter 4) show that 96% saves water, 10% use renewable energy, 61% use energy-efficient equipment, 47% use biodegradable raw materials, 41% use reusable materials and 44% use recycled materials.

The main raw materials are 74% unprocessed fruits, vegetables and herbs, while 26% use ready-made semi-products, syrups and chemically derived substitutes. 55% of manufacturers have 1-10 employees, 28% have 11-30 employees, 8% have 31-50 employees, and 9% have more than 51 employees. 38% of raw materials are imported from domestic manufacturers and organizations, 24% from wholesalers and retailers, 18% from importing organizations, 12% are imported by themselves, and the remaining 8% is processed by themselves.

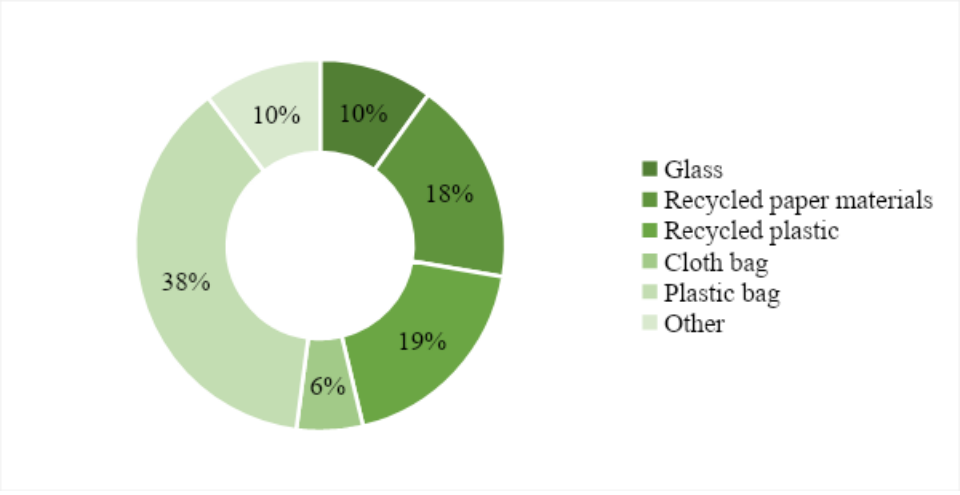
Figure 34. Food and beverage production inputs



Source: Survey results

Food and beverage production processes vary, and equipment is regularly maintained and cleaned. 38% of finished products are stored in plastic bags, 18% recycled plastic bottles, 18% in recycled paper materials, 10% in glass, and 6% in cotton bags.

Figure 35. Food and beverage storage



Source: Survey results

13.1% of the producers implemented the Organic Food Certificate of the MoFALI, 15.6% implemented Good Agricultural Practices, 20% implemented ISO 22000 Food Safety Management System, and 13.7% implemented ISO 14001 Environmental Management System.

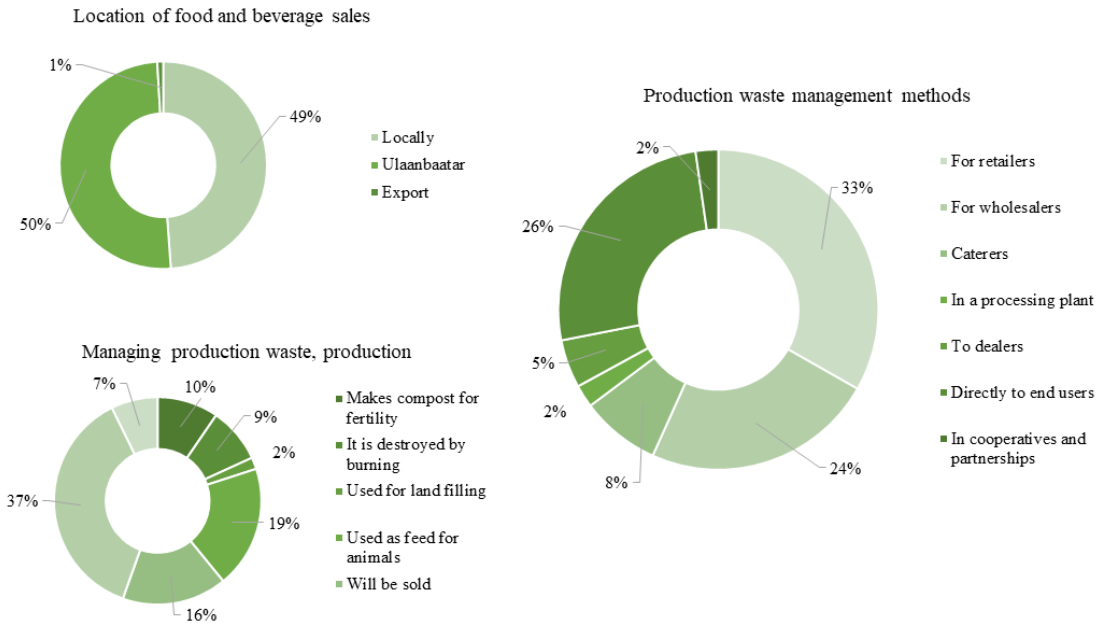
Table 28. Green certification status of food and beverage industry

		Not heard of these	No, it is not planned	No, but it is planned	Yes, early stages of implementation	Yes, it has been implemented	Total
The Organic product/certified organic eco-label of MNCCI	Q-ty	15	37	76	11	21	160
	%	9.38%	23.13%	47.50%	6.88%	13.13%	100.00%
Organic food certificate of the MoFALI	Q-ty	11	47	75	6	21	160
	%	6.88%	29.38%	46.88%	3.75%	13.13%	100.00%
MNS 6737:2018 Good Agricultural Practices	Q-ty	23	46	50	16	25	160
	%	14.38%	28.75%	31.25%	10.00%	15.63%	100.00%
ISO 22000 Food safety management system	Q-ty	11	39	56	22	32	160
	%	6.88%	24.38%	35.00%	13.75%	20.00%	100.00%
ISO 14001 Environmental Management system	Q-ty	20	45	55	18	22	160
	%	12.50%	28.13%	34.38%	11.25%	13.75%	100.00%

Source: Survey results

50% of the products are sold in Ulaanbaatar, 49% are sold in the rural areas and 1% is exported. 33% to retailers, 24% to wholesalers, 26% to direct end users, 8% to food service providers, 5% to intermediaries, 2% to processing plants and 2% to cooperative societies. 10% of industrial waste is composted, 9% is incinerated, 2% is used for landfills, 19% is used as animal feed, 16% is sold, and 37% is disposed unprocessed.

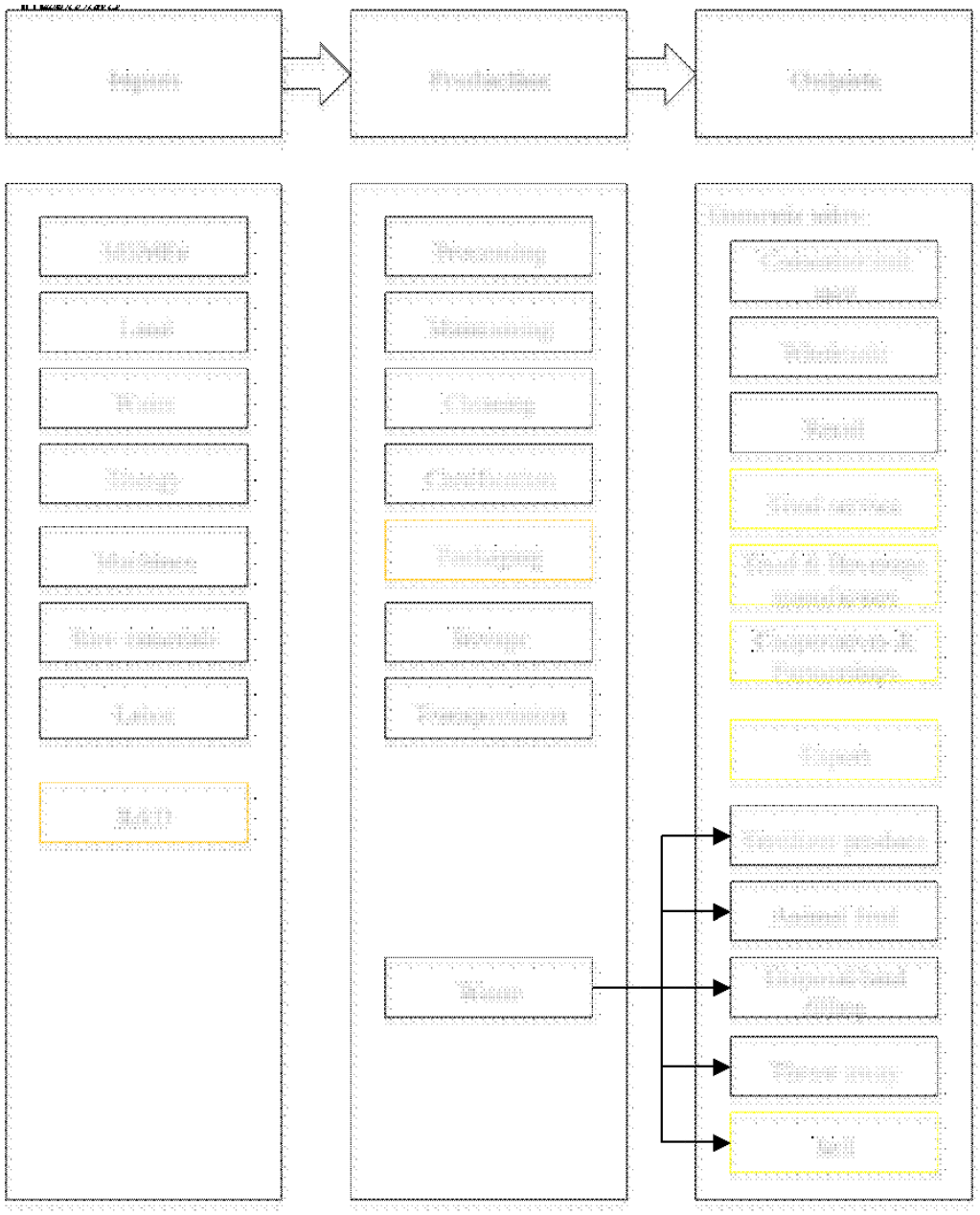
Figure 36. Food and beverage output



Source: Survey results

In the food and beverage industry, there is little research and development, green certification is relatively high compared to other sub-sectors, and a small amount is exported. There is also the experience of reselling industrial waste. In the case of flour and bakery products, the value chain up to the end product is developed, while the value-added production chain of products such as potatoes, vegetables, delicate vegetables, and honey is poorly developed.

Image 13. Value chain mapping of the food and beverage industry



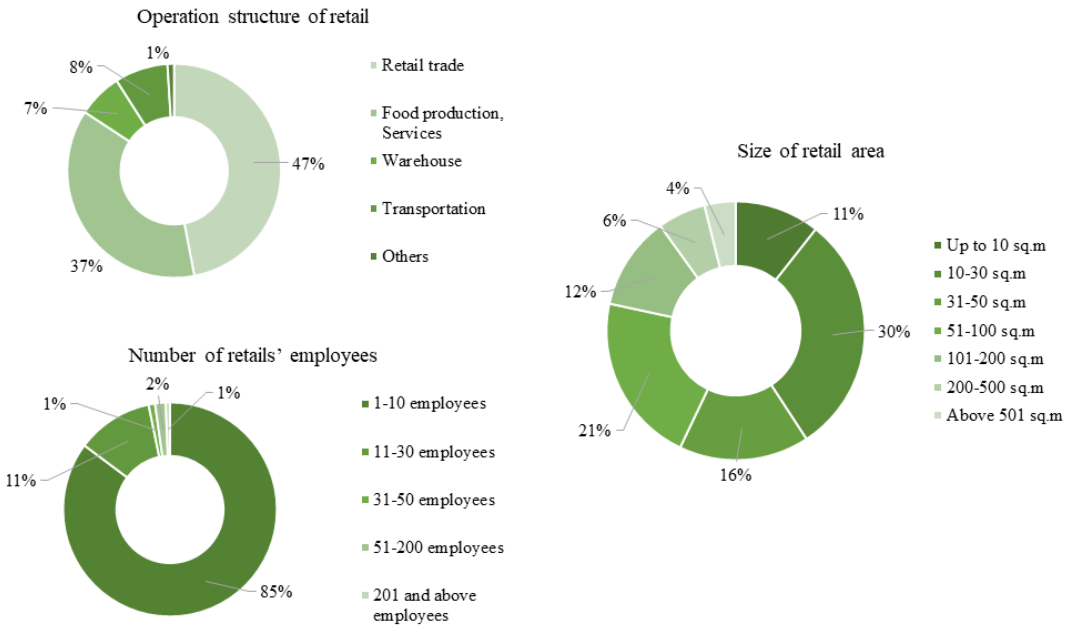
Source: Survey team

5.1.4. Value chain analysis of Retailers

47% of participants of retail, 37% of food production and service, 7% of warehousing, and 8% of transportation service providers. 85% of the retailers are micro, 11% are small, and 4% are medium and large organizations. 11% of them are operating in an area of up to 10m2, 30% in 10-30m2, 16% in 31-50m2, 21% in 51-100m2, 12% in 101-200m2, 6% in 201-500m2, and 4% in an area of more than 501m2.

Some of the results of the analysis carried out in the circular economy practice section (Chapter 4) show that 85% use consumption water savings, 17% use rainwater and greywater, 39% use energy efficient equipment, 35% use reusable materials and 38% use recycled materials. 85% of retailers and service providers have 1-10 employees, 11% have 11-30 employees, and 4% have more than 31 employees.

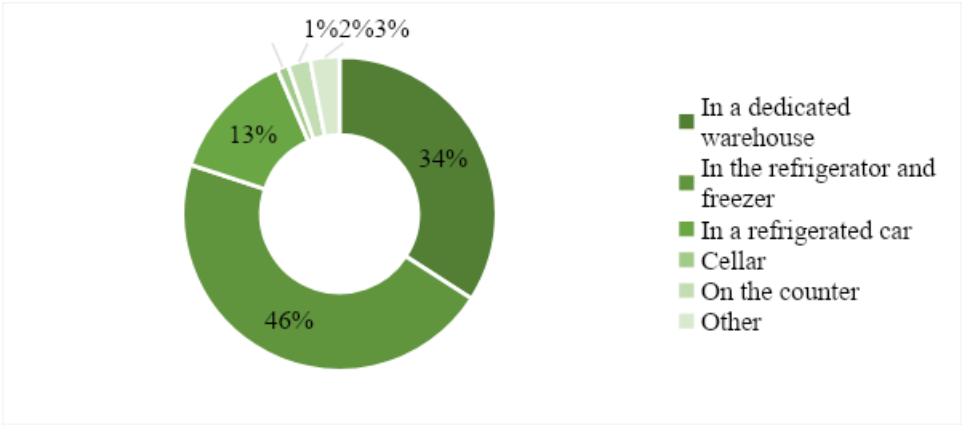
Figure 37. Retail inputs



Source: Survey results

82% clean the equipment regularly and the regular maintenance of equipment is at 83%. 34% of finished products are stored in designated warehouses, 46% in refrigerators and freezers, and 14% in refrigerated vehicles.

Figure 38. Storage products for retailers



Source: Survey results

12% of the Retail trade and service providers implemented the Organic Food Certificate of the MoFALI, 10% implemented Good Agricultural Practices, 23% implemented ISO 22000 Food Safety Management System, and 10.8% implemented ISO 14001 Environmental Management System.

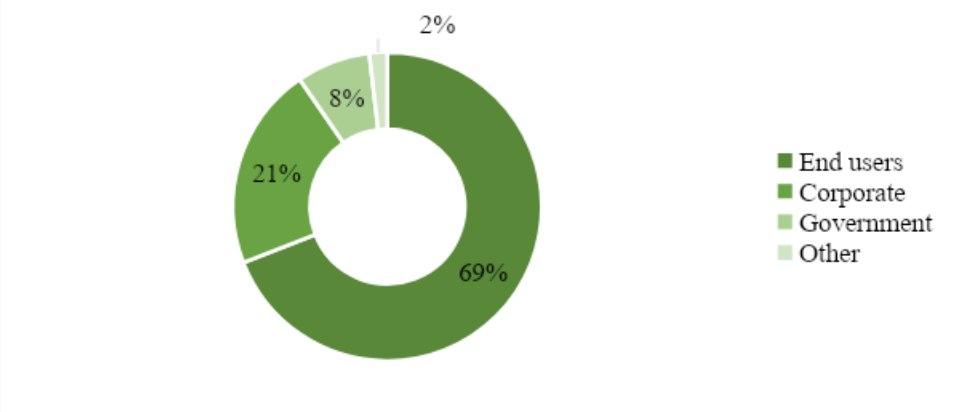
Table 29. Green certification status of retailers

		Not heard of these	No, it is not planned	No, but it is planned	Yes, early stages of implementation	Yes, it has been implemented	Total
The Organic product/certified organic eco-label of MNCCI	Q-ty	46	104	82	24	42	298
	%	15.44%	34.90%	27.52%	8.05%	14.09%	100.00%
Organic food certificate of the MoFALI	Q-ty	48	108	73	34	35	298
	%	16.11%	36.24%	24.50%	11.41%	11.74%	100.00%
MNS 6737:2018 Good Agricultural Practices	Q-ty	73	104	60	31	30	298
	%	24.50%	34.90%	20.13%	10.40%	10.07%	100.00%
ISO 22000 Food safety management system	Q-ty	46	71	69	43	69	298
	%	15.44%	23.83%	23.15%	14.43%	23.15%	100.00%
ISO 14001 Environmental Management system	Q-ty	66	98	64	38	32	298
	%	22.15%	32.89%	21.48%	12.75%	10.74%	100.00%

Source: Survey results

69% of consumers are direct end users, 21% are corporate users, and 8% is government organizations.

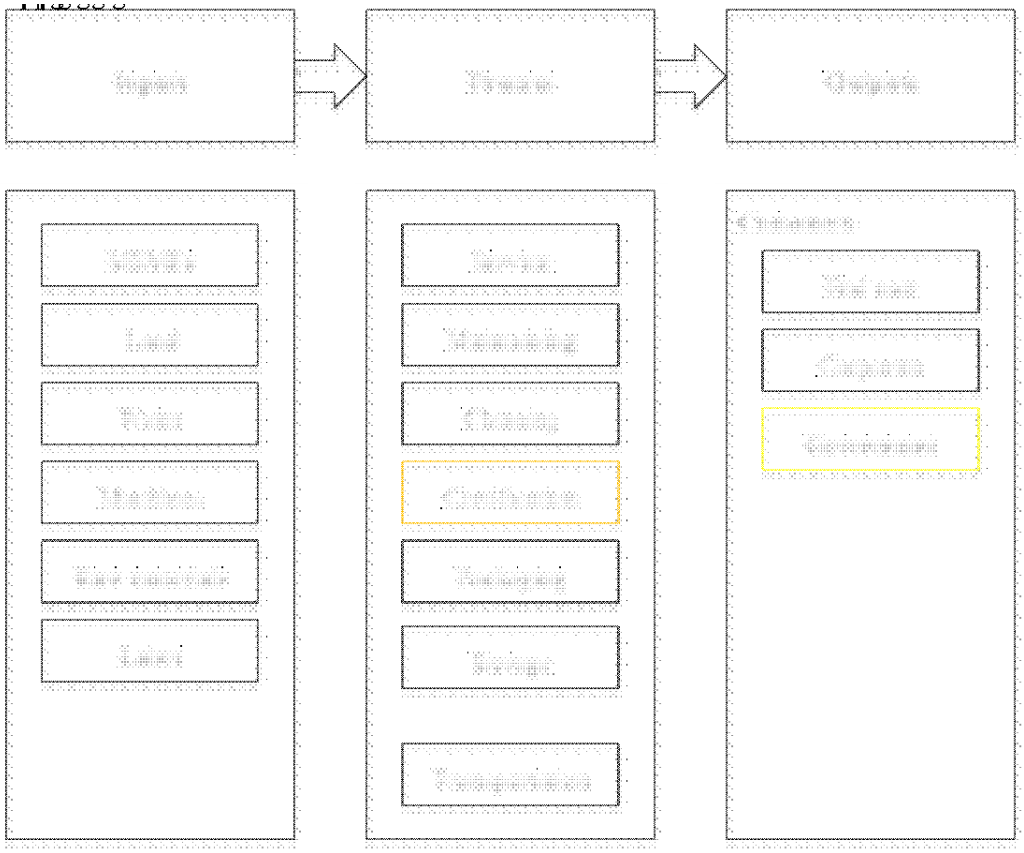
Figure 39. Customers of retailers



Source: Survey results

Value chain mapping based on retail trade and services value chain analysis has a relatively simple model compared to other sub-sectors. A small amount is sold to the government and public institutions.

Image 14. Value chain mapping of retailers



Source: Survey team

5.2. Bottleneck analysis of value chain

Based on the value chain analysis of the Agri-food and beverage sector of Mongolia, the bottleneck facing the value chain was identified and suggestions were made on how to increase the competitiveness of the MSMEs.

If we look at the competitive situation of the sector, the level of competition is at the initial stage. Because the MSMEs have a small product range, low competition for domestic products, weak capacity of technical equipment at the enterprise, weak standard enforcement, and less flexibility to adapt to customer needs. It does not have its own established sales channels and supplies to wholesalers. The production volume is low. There is no cost advantage and no opportunity to save money for expansion. The current competitiveness of MSMEs limits their opportunities to expand their operations, expand their markets, and further limits their adaptation to green economic practices.

The obstacles described above are encountered at all stages of the value chain. These include:

Sales marketing. MSMEs are making initial efforts to build and promote their brands to increase sales, but they are not taking full advantage of advertising and marketing activities. The challenge is to create conditions for recognition and acceptance in the market.

Product development. MSMEs have little flexibility to adapt to changes in the market and customer requirements due to the capabilities of technical equipment. Although Mongolian consumers are interested in buying domestic products, their requirements for products and services are increasing. Therefore, there is a need for MSMEs to update their products and offer services that increase their value.

Sales channel. Due to the small production volume, the products are sold through the wholesale network. The results of the survey showed that the percentage of cooperation with large buyers and food industries is very low.

Operational efficiency. Very few organizations have established long-term relationships with few key partners, and issues such as working capital, receivables, inventory storage, inventory management, and sales support are the most affected. It can be seen that MSMEs should not only focus on increasing their sales because there is an opportunity to increase the ability to manage and control raw materials and inventory resources. It appears that there is a need for further detailed research to understand the product supply chain system and identify the influencing factors.

Waste and depreciation. Vegetables and fruits are perishable, seasonal products and have a short shelf life. It requires low-temperature storage and requires temperature control. Hence, the logistics of these agricultural products are concerned with the entire value-added process from

cultivation to harvesting, processing, packaging, canning, transportation and distribution. The percentage of food waste has been calculated by international research organizations.[12]

Table 30. Food waste percentage calculation coefficient

Products	Transportation and distribution waste	Household waste	Food industry waste
Rice	0.3%	6.0%	18.0%
Flour	0.5%	6.0%	6.0%
Bread	4.8%	29.0%	20.0%
Bakery products	4.8%	15.0%	20.0%
Vegetable	0.2%	12.0%	9.3%
Potatoes	0.0%	30.3%	30.6%

Эх сурвалж: Caldeira et al 2019.

Transportation. According to the results of the research, there is no integrated process of harvest and collection in the regions of vegetable and fruit cultivation. Farming households grow and harvest vegetables and fruits separately and in different ways, thereof sell them in wholesale and retail markets, so pre-shipment packaging and processing are not uniform. This disrupts the transportation process at different points in the supply chain when products are unloaded and repackaged, resulting in time and cost, and product deterioration due to not being kept at the proper temperature when changing vehicles.

Government policies in the field of agriculture, consumers' environmentally friendly purchasing behavior, and food safety requirements are increasing. Accordingly, The Agri-food and beverage sector MSMEs not only have opportunities to expand, but also face the challenge of making their products and services eco-friendly. For this, there is a real need to take the first steps to introduce the concept of sustainable development into the operations.

To increase the competitiveness of domestic producers, the following value chain activities are important.[13]

- Product and service: Basic market research, product portfolio development, and customization to meet customer needs;
- Product development: Technological innovation and product design;

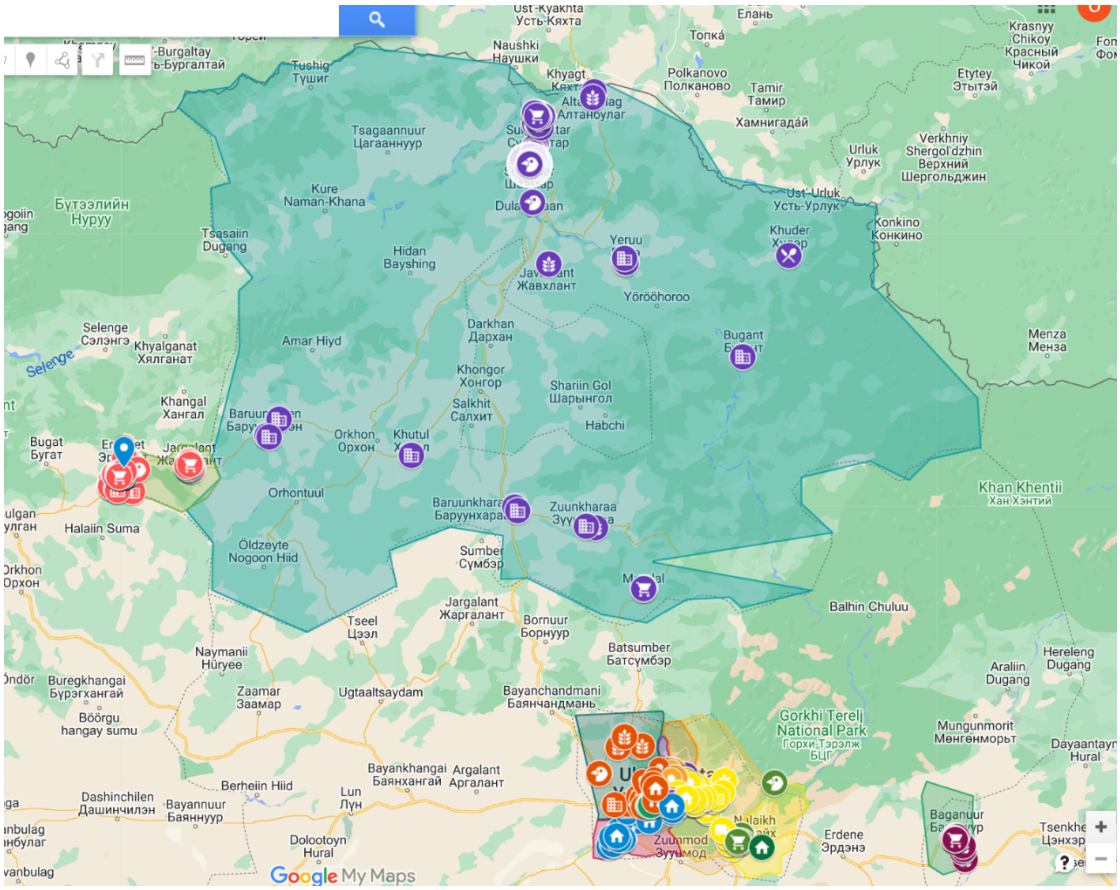
[12] C.Caldeira, V.De Laurentiis, S.Corrado. 2019. Quantification of food waste per product group along the food supply chain in the European Union: a mass flow analysis
[13] J.Kim. 2007. Value Chain Bottleneck in China: Emerging Challenges and Managerial Framework

- Supply chain: Reliable supplier of raw materials, inventory stocking, retrieval, and distribution;
- Production: Product quality control and packaging;
- Assigned distribution: Regional distribution network, terms of purchase, and terms of payment;
- Sales and additional service: Product and packaging familiarization to customers find reliable and regular customers.

5.3. Geographical location

The geographical location and contact information of MSMEs were recorded in Google My Maps during data collection. Moreover, it was a measure to confirm the reliability of research data. The digital map can be viewed by geographical area (Ulaanbaatar city, Selenge province, Erdenet province) and sub-sectors.

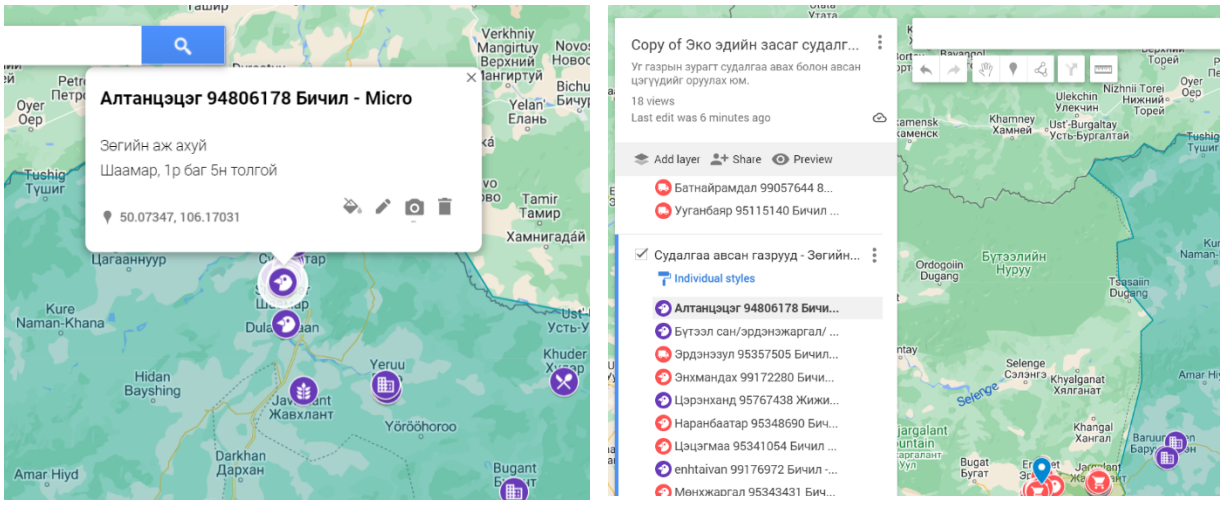
Image 15. The geographical location of MSMEs



Source: Google map

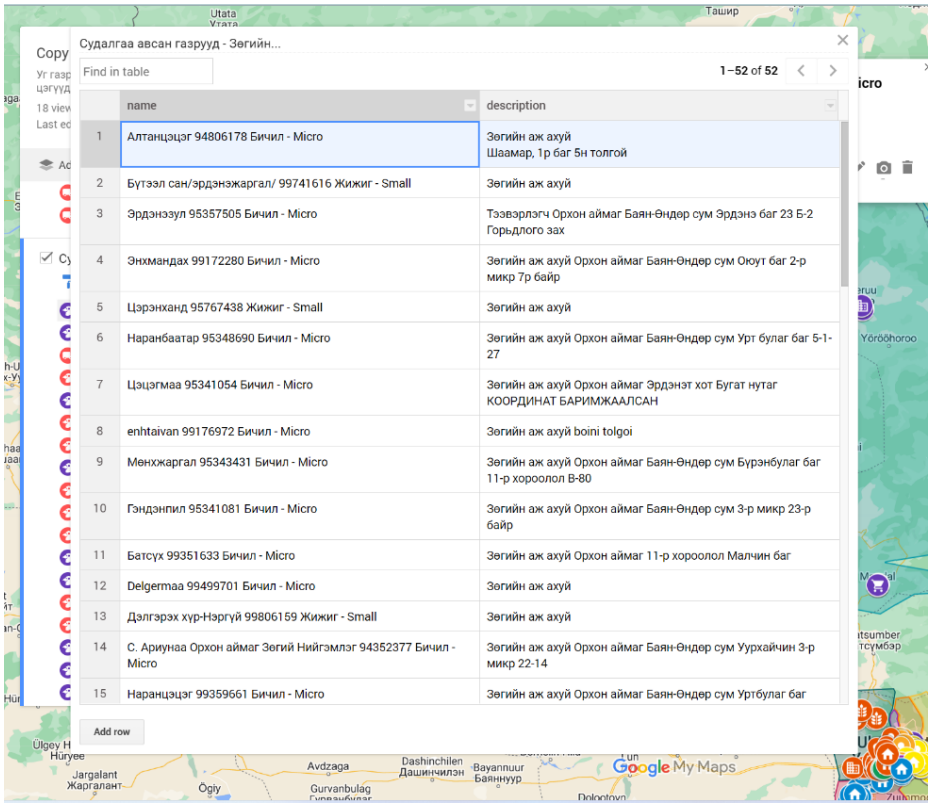
From the digital map, it is possible to easily see the geographic location, and personal information of the participants.

Image 16. Contact details of participants



It is also possible to view participants' names, contact information and descriptions in the table.

Image 17. Table of contact information for participants



6. INTERNATIONAL BEST PRACTICES OF CIRCULAR ECONOMY

This section provides an overview of circular economy studies conducted in other nations and includes in-depth information on the tactics and resources utilized by international micro, small, and medium-sized business organizations to put circular economy practices into effect.

6.1. Circular economy and its implementation practices

Sustainable future development involves a shift from the linear 'take-make-consume-dispose' logic to a circular system based on 3R principles by recycling and reusing products, components and materials while reducing waste to a minimum (EMF, 2013)

The growing attention paid by policymakers, non-governmental organizations and scholars has prompted agro-food companies to incorporate sustainability into their corporate strategies (Sica, Malandrino, & Supino, 2018).[14]

Theoretically, it is necessary to highlight the development of the research that has been studied extensively in the CE field applied to the agri-food sector and to understand the trends and best practices. Among European countries, Italy has provided a wider number of contributions. This is justified by Italy's strategic positioning on the CE and due to the increasing regulatory focus. Although Asian countries, in particular China, are pioneers of the CE as a new model of sustainable development (Geng & Doberstein, 2008)[3](EMF, 2013) (Sica, Malandrino, & Supino, 2018)

China has paid particular attention to CE issues from a regulatory point of view (Yuan, Bi, & Moriguichi, 2006).[1] North America, South America, Africa and Oceania have contributed fewer research works than the other regions.

Practically, several of leading countries leading the circular economy shift such as Germany, Italy, Sweden and other European countries, China, Japan, Korea, Indonesia, Vietnam, Kazakhstan and Turkey have introduced best practices, acts and laws for establishing the 3R principle of a circular economy.

Germany is the forerunner in this as it started implementing CE in 1996. Sweden has for a long time successively introduced various incentive programs. They have also tried to facilitate optimal conditions for a gradual and effective increase in the rate of recycling through public education.

Sweden, Germany, and several other European countries have managed to incorporate green political parties into their political systems.

The Government of Japan has developed a comprehensive legal framework for the country's move toward a recycling-based society.

[14] Sica, D., Malandrino, O., & Supino, S. (2018). The Corporate Social Responsibility in the Italian Agro-food Sector. *Sustainability. 2018*, 358-364.

China is the only country that has developed the concept of CE and has practiced it as a development strategy on a large scale. Ideally, successful implementation of the CE policy takes place simultaneously at all three levels of aggregation: micro, meso and macro.

At the low level of aggregation and activity area, namely the production of firms and agricultural products, producers are encouraged and required to adopt cleaner production methods and eco-designs.

At the intermediate meso level, the CE practices include developing eco-industrial parks and eco-agricultural systems.

Finally, the CE practice at the aggregate macro level requires extensive cooperative networks and active cooperation

Another successful implementation strategy was to develop PILOT CITY in China. As part of the CE strategy, the Dalian municipality decided to shut down small-scale facilities with high energy use rates and encourage energy-saving technologies and production scales instead.

Dalian, Beijing, Shanghai, and Tianjin city used the evaluation indicators system of the circular economy. However, the cities' performances differ from one indicator to another and their positions with reference to best practice technology and policy changes also differ. However, the cities' performances differ from one indicator to another and their positions with concerning best practice technology and policy changes also differ.

The Swedish national-level sustainable development strategy defines the long-term vision of a sustainable society and is expected to include all three dimensions of sustainability -- ecological, social, and economic

The Swedish government has prioritized eight strategic core areas: the future environment; limitation of climate change; population and public health; social cohesion and welfare; employment and learning; economic growth and competitiveness; regional development and cohesion; and community development (GO-ME, 2002). [15]

Germany and Japan are among the few successful country case studies of CE implementation and its further development. The two countries' success is attributed to the general public's awareness and participation in the strategy's implementation.

Reducing food loss has become a norm in Japan after a decade of efforts. By mainstreaming waste management and effective use of resources, Japan has reached significant success in recycling while protecting people's health (Shokuhin, 2020).[16] Over 420 municipalities actively participated in the "No-leftover Campaign". This nationwide network facilitates government-to-government collaboration and public-private partnerships to reduce food loss.

[15] GO-ME. (2002). *Sweden's National Strategy for Sustainable Development.*

[16] Shokuhin, M. (2020). *The current status of food loss in Japan*. Retrieved from https://bit.ly/36ci4QU

To advocate food loss reduction in the business sector, Hiroshima city calls for restaurants and hotels in the city to register as "shops for zero-leftover". Restaurants and hotels are recommended to design a menu with small portions and accept customers' requests for taking leftovers away. Consumers visiting these stores can buy a moderate amount of food and learn tips to keep fresh food properly. As of 2020, there are 155 food retailers registered to cooperate with (Kimura, 2008).[17] Understanding information with simple texts and photos will help motivate citizens and businesses to act for zero-leftover, Eco-cooking, Smile! Hiroshima" Campaign activities, the "Waste Reducing Day" is the most influential one for information dissemination and awareness-raising.

In Korea, the Seoul Metropolitan Government has been undertaking a series of initiatives and projects. To achieve Seoul's urban agriculture goal by 2030, the city unveiled its first Urban Agriculture Master Plan in 2012.

In 2019, the SMG launched a website—City Farmers Portal—to provide farmers and practitioners with technical assistance. The website demonstrates success stories about urban farmers and how they prepare for urban agriculture.

The city-affiliated Seoul Agricultural Technology Center plays a vital role to provide technical and knowledge support for urban farming development. The center offers knowledge about plant species, the best environment for growth and useful advice on plant disease treatment. The center sets up "communities of experts" and gives lectures to citizens who are interested in agriculture. Participants will be awarded certificates after completion of the curriculum. Certificated trainees will be recognized as experts and continue contributing to the center for upscaling the urban agriculture (Government, 2019).[18]

6.2. Circular economy best practices

The agro-food industry is responsible for almost one-quarter of global greenhouse gas emissions(McArthur, 2019).[19] Currently, 56% of food waste occurs in developed countries (Koehring, 2019).[20]

Given the quantum of waste generated by the agro-food industry, there exists tremendous potential to reduce waste through more circular practices. Agri-food companies have begun to invest in researching and implementing circular solutions to address food loss and waste. Many improvements can be applied to reduce both inputs and waste products in food production.

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[17] Kimura, A. H. (2008). The chisan-chisho movement: Japanese local food movement and its challenges. *Agriculture and Human Values*, 49-64.
[18] Government, S. M. (2019). Rainwater and food waste use. *Korea Journal of Population and Development*.

[19] McArthur, E. f. (2019). *Cities and Circular Economy for Food*. Retrieved fromhttps://web.archive.org/web/20201207132248/https://www.ellenmacarthurfoundation.org/publications/cities-and-circular-economy-for-food

[20] Koehring, M. (2019). *How fixing broken food systems can help us meet all the SDGs.* . Retrieved from World Economic Forum: https://web.archive.org/web/20201209132611/https://www.weforum.org/agenda/2019/07/food-waste-loss-malnutrition-sustainable-development-goals/

This global scan of best circular economy practices in the agro-food sector reveals that selected firms and operations are already implementing a wide range of practices that support circular economy objectives and strategies, whether or not these practices are explicitly identified as circular. However, more widespread adoption of such strategies and practices will be key to reducing the current levels of food loss and waste, while also meeting the growing demand for food.

Japan: the food drive program in Hiroshima city

The Hiroshima City government regularly works with sports activities and universities on "Food Drive" activities. The city government set up a booth and called for citizens' donations of food that still can be eaten. Canned foods, sweeties and cookies, and noodles are the most common ones. After the one day event, the Hiroshima City government handed over the food to a local food-bank organization— Aiai Net. Established in 2008, Aiai Net has been one of the key players in the Hiroshima region to provide food support for vulnerable groups, including single-parent households and homeless people.

Japan: the salvage party program in Sapporo city

The salvage party, encourages households and citizens to maximally utilize every part of vegetables and reduce food-loss. In the workshop, households brought food they want to throw away even though the food can still be eaten, including old vegetables, canned food prepared for disasters, and foreign canned food.

Korea: the jugong complex

To avoid any adverse implications on the building's structure, the residents reached an agreement to convert the unused land (approximately 330 square meters) next to the apartment into a farm, instead of turning the rooftop for farming purposes. Pipelines adhere to the building for rainwater collection from the rooftop. Rainwater flows through the pipes into a new constructed underground storage tank with 20 tons capacity

Korea: Sangdo metro station

In Seoul City, spaces in metro stations are leased to small and medium businesses. Some areas are often idled, and the potential has not yet been unlocked. The public-private smart metro farm at Sangdo Metro Station is an experimental approach to introducing urban farming in these spaces at the city center. The public-private smart metro farm at Sangdo Metro Station is an experimental approach to introducing urban farming in these spaces in the city center. The Farm offers commuters an option to purchase greens grown in the center on the way heading home. Refrigerated transport shipping vegetables from rural areas to the city can be saved as well as the energy used. The Farm absorbs CO2 from the metro station and pumps oxygen.

Agriprotein is a South African company that uses insect agriculture to address food waste. The Black Soldier Fly can increase its weight 200 times in ten days. Once the fly larvae reach their maximum size, they are dried and milled to remove fat and turned into an organic animal feed

called MagMeal. Their fat is then converted into oil used as a health supplement for animals, or as a biofuel. The remaining organic materials are transformed into nutrient-rich compost and sold to local farms.[21]

Loblaw: reducing retail food waste

In 2018, Canadian grocery retailer Loblaw committed to reducing or diverting their store-generated food waste by 50% before 2025. Loblaw has developed a wide variety of methods to achieve this goal including[22]:

1. Investing in inventory systems to ensure that the correct amount of food is ordered and cut down on unpurchased goods
2. Expanding their network of food banks
3. Directing stale or expired grocery goods to use in the making of grain-based animal feed
4. Converting used cooking oil into biodiesel

In the agro-food sector, a key focus of circular economy objectives is REDUCED resource consumption. One way to do this is by integrating eco-design elements into corporate mandates. For instance, “Arla dairy” /the most climate-efficient dairy Danish-Swedish farm in the world/ farmers have begun to design farms that reduce carbon emissions and improve sustainability through increased energy efficiency. Another way to reduce resource consumption is increased production efficiency through process optimization. Applications of process optimization include shortening supply chains to match supply to consumer demand thereby creating less unwanted food, and reducing transportation needs. Finnish restaurant Ultima, for example, grows its ingredients on its restaurant premises to eliminate waste packing and transport impacts.

One effective strategy to achieve this is by creating sharing economies. For example, food-sharing projects, like the Community Fridge in Ottawa, provide an app-based platform for households and businesses to share surplus food with others to pick up, instead of it being wasted.

Due to the perishable nature of food products, there exist limited ways of extending their lifespan. However, food can be diverted from landfills by donating and reselling surplus food. For example, Canadian grocery chain Metro applies the practice of surplus food recovery by donating 6 million meals to community organizations in 2018 through its food recovery program.

HelloFresh is one example of a subscription-based meal service that delivers fresh, pre-portioned ingredients and recipes to customers every week. Finally, the agro-food sector has long been a leader in practices to give resources new life such as recycling and composting programs.

Re-appropriation of food waste and surplus is another technique. This can be done several ways such as being made into fabric, as Orange Fiber is doing with orange peels, or turning food not fit for human consumption into animal feed. Energy recovery is yet another strategy used by the agro-food sector to give resources new life. Maple Leaf Foods diverted 5,486 metric tons of

[21] Case studies (archive.org)
[22] Wayback Machine (archive.org)

packaged meat waste to biodigesters in 2017, producing 2.1 million kWh of green electricity that was fed back into the Ontario electrical grid and prevented 1,473 tons of CO2 emissions. McDonald's France collects used cooking oil from its restaurants and transports it to a processing plant to make biofuel.

Table 31. Circular economy objectives, strategies, and practices

Objectives	Strategies	Practices	
1. Reduce resource consumption /REDUCE/	1.1 Eco design	Agro ecology	Zero waste grocery delivery
		Zero waste grocery stores	Energy efficiency
	1.2 Process optimization	Shorter supply chains	Agri-metrics yield tracking
		Digital food waste tracking	Quality control
	1.3 Responsible consumption and procurement	Consumer awareness	Discounting soon expiring food
		Sustainable food choice	Sustainable procurement
2. Intensified product use /REUSE/	2.1 Sharing economy	Cooperative supermarket	Food sharing
3. Extending life of products and components	3.2 Donating and reselling	Surplus food recovery	Re-appropriation of surplus food
	3.4 Performance economy	Meal subscription service	
4. Giving resource new life /RECYCLE/	4.1 Industrial ecology	Agricultural industrial eco-park	
	4.2 Recycling and composting	Green bins	Nutrient recovery
		Re-appropriation of food waste	

6.2.1. Objective 1. Reduced Resource Consumption

1. Energy efficiency

Arla Foods dairy farm[23] in Denmark uses the heat of milk to heat the underfloor of the farmhouse. Warm air is generated when the fresh milk from the cows is cooled from 37°C to 4°C. It is then pumped from the milk tank to the farmhouse.

[23] Hans Clausen | Arla (archive.org)

Nu Grocery[24] нь is an Ottawa-based grocery store that strives to eliminate packaging waste. Customers bring reusable containers to the store which they can then fill with the exact quantity of goods they wish to purchase.

2. Zero waste grocery delivery

Loblaw Companies Limited and Loop[25] launched a pilot program in 2021 that will deliver select products in reusable containers right to the door of customers. When finished with the product, the packaging is collected, cleaned, and refilled by Loop.

3. Shorter supply chain

Lufa Farms[26] is a Montreal-based urban farming company that runs three commercial rooftop hydroponic greenhouses. They deliver food from these rooftops directly to company partners and homes

4. Digital food waste tracking

Winnow[27] is an international software company that enables large commercial kitchens to monitor their food waste. It helps identify why and where waste is happening so that appropriate operational decisions can be made to minimize it. IKEA installed Winnow in 35% of their kitchens and saved an estimated 1 million meals within a few months.

5. Quality control

The Calgary Italian Bakery[28] is one of the largest independent bakeries in Western Canada. They are working on improving their bread line dough transfer and English muffin quality consistency (approx. 50% of their English muffin waste is characterized as deformed or misshaped). If fully realized, they will save 50,000 kg of bread dough per year.

6. Consumer awareness

The 'Re-Imagine Food' Campaign[29] CDN by the City of Guelph aims to educate residents on the real costs of food waste, boost demand for circular economy productions, and build stronger relationships between food producers and consumers.

Metro Vancouver[30] CDN partnered with WRAP UK to launch the first Canadian branch of the Love Food Hate Waste campaign. The campaign aims to help people reduce food waste at home, provide storage tips to elongate food life, help with portion calculation to determine how much

[24] our story - NU Grocery (archive.org)
[25] Loop And Loblaw To Bring Circular Shopping Platform To Canada (newswire.ca)
[26] How it works (archive.org)
[27] Winnow | Cutting Food Waste Within Hospitality (archive.org)
[28] Wayback Machine (archive.org)
[29] Wayback Machine (archive.org)
[30] Solid Waste (archive.org)

of each ingredient to buy, and provides seasonal menus. The campaign has numerous partners, including Sobeys.

7. Discounting soon-expiring food

Walmart[31] CDN offers discounted repacked bruised or peak freshness produces through their $1/$2 Bag Program. They also reduce prices through their Customer Value Program to allow for the quick sale of fresh meat, bakery, dairy, and produce items approaching their best before dates. Walmart is committed to achieving zero food waste by 2025.

Loblaws partners with Flashfood[32] an app that allows customers to purchase food items nearing expiration at a reduced price of up to 50% off at select Loblaws grocery stores.

We-Food[33] is a charitable organization in Denmark that operates a supermarket selling food that is past the best before date. Operated by volunteers, We-Food diverted an estimated 125 tons of food in 2016 from Danish landfills.

8. Sustainable food choices

Loblaw[34] has been selling cricket flour since 2018 in its stores across Canada. This is an option for consumers who want to lower the environmental impacts of their consumption

9. Sustainable procurement

Westbury Street Holdings[35] is a firm in the UK that facilitates supply chain management from agricultural suppliers to restaurants and grocery stores with sustainability at the forefront. They do so by working with producers that meet or exceed environmental standards as a part of accreditation schemes.

6.2.2. Objective 2. Intensified Product

1. Cooperative supermarket

BEES Coop[36] in Brussels is a cooperative supermarket where the customer is a co-operator. The co-operator commits themselves to work 3 hours per month within the supermarket and in return can shop at the supermarket. The supermarket gives priority to local producers, ecologically-grown products, and seasonal products. They promote bulk food to reduce packaging waste and promote food-saving behavior.

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[31] Walmart Canada - Sustainability (archive.org)
[32] Loblaw Introduces National Program to Save Customers Money While Reducing Store-Generated Food Waste (archive.org)
[33] Danish supermarket gives expired food another shelf life - CBC.ca | Metro Morning (archive.org)
[34] Loblaws launches cricket flour in sustainability effort - The Fulcrum (archive.org)
[35] Wayback Machine (archive.org)
[36] Home - Bees Coop (archive.org)

2. Food sharing

FoodSharing[37] is an online platform that saves and distributes surplus food in Germany and Austria. It is entirely volunteer-run. Any individuals, retailers and producers can offer or collect food that would otherwise be thrown away. Food must be passed on for free before its expiry date.

6.2.3. Objective 3. Extending Life of Products and Components

1. Surplus food recovery

Bourse aux Dons[38] is a digital platform in Brussels, Belgium that matches fresh produce collected by the DREAM project to over 50 charities across the city. The DREAM project collaborates with 20 professional merchants from the early morning market in Brussels to collect over one ton of excess fruits and vegetables every day.

La Tablée des Chefs[39] is a Montreal-based program that began in 2012 by providing culinary education to youth but quickly expanded to developing a food recovery program. They launched programs in Vancouver, Calgary, France, and Mexico, recovering almost 250,000 portions of food in 2013 alone.

2. Re-appropriation of surplus food

Toast Ale Beer[40] is a British company that uses surplus bread from bakeries all over London to make their beer.

Loop[41] is a Finnish restaurant that collects 600kg of surplus food each day from six suppliers and supermarkets. It uses this collected food to create high-quality canteen food, gourmet meals, and artisanal ice cream. Any remaining edible food is directed to charities or composted.

Boomerang[42] is a Canadian company that produces flour from brewing residues. In addition to reducing food waste, this product reduces the transportation, agricultural land and water required for flour production, thus reducing its carbon and water footprints.

3. Meal subscription service

HelloFresh[43]is an international subscription-based meal service that delivers fresh, pre-portioned ingredients, and recipes every week. By pre-portioning ingredients, they help reduce household food waste.

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[37] foodsharing | Rette mit! (archive.org)
[38] Bourse aux dons (archive.org)
[39] History - La Tablée des Chefs (archive.org)
[40] Bread - Toast Ale (archive.org)
[41] The role of restaurants in a circular urban food system (archive.org)
[42] Wayback Machine (archive.org)
[43] Discover a Healthy Meal Plan | Weekly Recipes | HelloFresh (archive.org)

6.2.4. Objective 4. Giving Resources New Life

1. Agricultural eco-industrial parks

National Economic Technological Development Area (NETD)[44] in Zhengzhou, China is an Agri-industrial park. It produces small- or medium-sized and low-emission farm vehicles and agricultural machinery, and processes agricultural products from regional rural areas. It also provides technical guidance and information services to meet the demand for rapid development of agriculture

2. Green bin program

The City of Guelph's Green Bin Program[45] CDN collects 10,000 tonnes of food by-products each year, diverting 32% of organics from landfill.

3. Nutrient recovery

Ostara Nutrient Recovery Technology[46] CDN is a Vancouver-based company that recovers 85% of the phosphorus and up to 15% of the nitrogen in wastewater, transforming these recovered materials into a high-value fertilizer product called 'Crystal Green'.

Lystek Inc.[47] CDN, contracted by the City of Guelph, converts and manages the 4,500 tons of biosolids generated each year by the city's wastewater treatment facility. It converts these biosolids into commercially viable liquid organic fertilizers.

4. Re-appropriation of food waste

Oreka Solutions[48] is a Wellington-based company that collects food waste and feeds it to black soldier flies. It then converts the flies into three products: a solid fertilizer that enhances the soil's microbiome, a liquid biofertilizer for aquaponic growing solutions, and a feedstock for fish, pigs, and chickens.

Arla Foods[49] a dairy company in Scandinavia, sends 100% of their food waste no longer fit for human consumption from their largest factory to animal feed instead of anaerobic digestion.

BioBean[50] in the UK is the first company to industrialize the process of recycling waste coffee grounds into biomass heating briquettes and pellets. It heads the world's first coffee recycling factory and is researching biochemicals made from coffee grounds.

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[44] The design of agri-industrial ecological park: A case study of Zhengzhou national economic-technological development area | 刘晶茹 LIU Jingru (archive.org)
[45] Wayback Machine (archive.org)
[46] Ostara Nutrient Recovery Technologies Inc. (archive.org)
[47] Wayback Machine (archive.org)
[48] Wayback Machine (archive.org)
[49] Sustainable Dairy Production | Arla (archive.org)
[50] About bio-bean - pioneers of recycling coffee waste into clean fuel (archive.org)

5. Biogas and electricity

Maple Leaf Foods[51] CDN diverted over 5,486 metric tons of packaged meat waste to StormFisher bio-digesters in 2017 to generate electricity. This produced over 2,178,000 kWh of green electricity that was provided back to the Ontario grid. This prevented over 1,473 tons of CO2 emissions and produced over 390 metric tons of organic fertilizer.

The Billund Biorefinery[52] in Denmark treats organic waste from agriculture, industry, and local households. It generates biogas and transforms it into electricity and heat. The leftover nutrients are then used to make an effective organic fertilizer.

Sainsbury superstore[53] in Cannock, UK runs entirely on power produced from the food waste the store generates. A cable links the store to the nearest anaerobic digestion facility, providing a direct supply of renewable energy.

6. Biofuel

McDonald's France[54] collects used cooking oil from its restaurants and transports it to a processing plant to make biofuel. The trucks that collect the cooking oil run on the produced biofuel.

Rothsay[55] is a Wellington-based company that turns old cooking oil, grease trap maintenance, and meat by-products from restaurants, retailers, processing facilities, and livestock raising into biofuel...

[51] Sustainability – Maple Leaf Foods (archive.org)
[52] Billund BioRefinery | State of Green (archive.org)
[53] Wayback Machine (archive.org)
[54] McDonald's recycles its waste to make biofuel for its delivery trucks | Living Circular (archive.org)
[55] Used Cooking Oil Collection, Pickup and Recycling Services | Rothsay (archive.org)

7. CONCLUSION

After analyzing the findings of the Agri-food and beverage sector, three major areas concluded: (1) identification of the subsector that could be developed as a priority; (2) determining the maturity level of the CE; and (3) define the causes and effects of the CE.

7.1. Priority sub-sectors for a development

Through the self-assessment questionnaire, MSMEs were able to determine their circular economy practices, organizational capacities, including financial capabilities, training needs, and knowledge of eco-labelling, and the differences between them were examined by each sub-sector. For each sub-sector, a value chain analysis was also carried out, and the challenges faced in the process of creating products and services were outlined. The following table summarizes the differences between sub-sectors, according to these 7 factors.

The importance of the above seven factors was assumed to be equal when selecting the sub-sector as a priority. Based on the results of the self-assessment and the value chain analysis, the highest possible sector is the sub-sector of food and beverage, followed by retail, bee farms, and finally the agriculture sub-sector.

Table 32. The result of the analysis to identify the priority sub-sector

№	Factors	Production	Retail	Bee farm	Agriculture
1	CE practices	• Paying attention only for the procurement • Cost-oriented policy is implemented • Eco-friendly packaging police is promoted	• Not inplemented • Capital based	• Efforts to be an eco-friendly • Uniqueness of the product is itself-eco • Cooperation is good among bee farmers	• Paying more attention to the resources • Capital based
2	CE strategy implementation	• It has been implemented	• It is planned	• No strategy, no policy	• It has been implemented and followed the standards
3	Value chain	• No research conducted • An experience in waste management • Eco-certification • In terms of organization structure, medium and large companies are the majority.	• Eco-certified	• Less waste • Micro, family-based businesses are the prevailed • CE practice implemented • A very few eco certificates	• No research conducted • No energy efficiency • Micro business with few employees • Experienced on waste management • Location distribition is good • Higher growth potential
4	Understanding of the eco-labelling	• Heard of it	• Heard of it	• Never heard of it	• Never heard of it
5	Capacity	• Digital capacity is good	• Capacity is good in all factors	• Capacity is not good	• Orgnizational culture, research, financial capacity is good
6	Training needs	• A Regular training	• Not established	• A Random training	• A random training

7	Financial possibilities	• A financial possibility is weak and identified the financial needs	• Good	• Needs to be improved	• Not good and needs to be improved

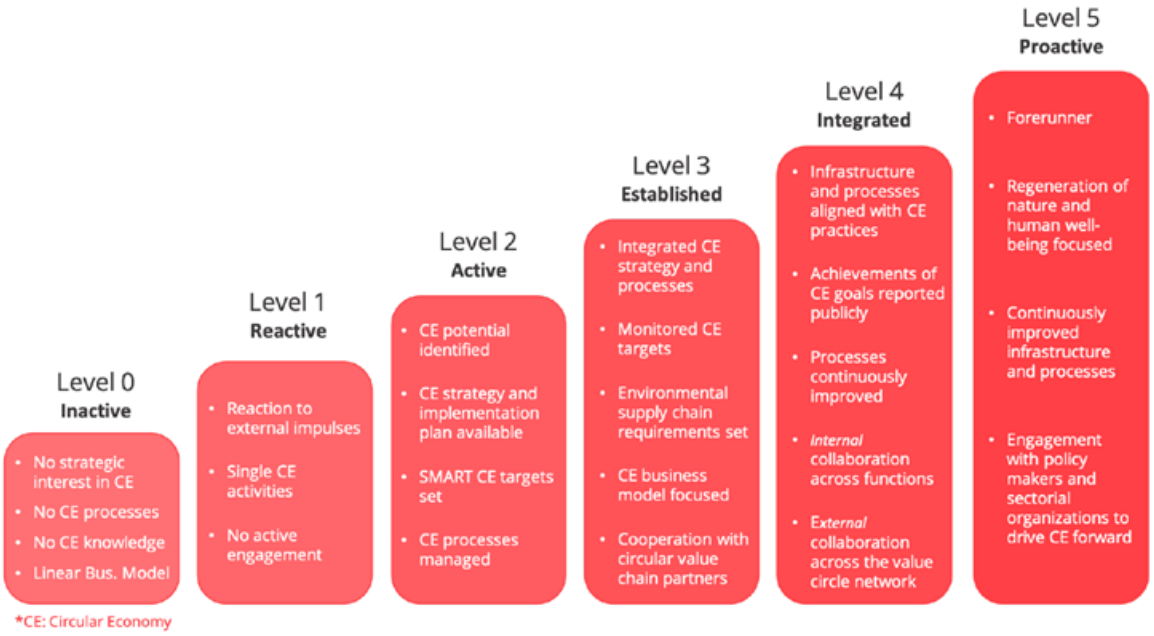
Table 33. Evaluation results and ranking of the priority sub-sectors

№	Factors	Weight	Production	Retail	Bee farm	Agriculture
1	CE practices	14%	1	4	2	3
2	CE policy implementation	14%	1	3	4	2
3	Value chain	14%	1	2	3	4
4	Understanding of the eco-labelling	14%	1	2	4	3
5	Organization's capacity	14%	3	1	4	2
6	Training needs	14%	2	3	1	4
7	Financial possibilities	14%	2	1	3	4
	Weighted average score	100%	1.57	2.29	3	3.14
	Rank		**#1**	**#2**	**#3**	**#4**

7.2. Circular economy practice Maturity level)

The Circular Maturity Model was used to develop the further training program of the project, which was also utilized to indicate how well MSMEs are now implementing circular economy practices and to determine where additional training is required. Six levels of maturity are offered by the circular economy maturity model (Circular Maturity Model). It defines the organizational characteristics and actions to be taken at each maturity level.

Image 18. Summarized maturity level definition across the business activities



Source: Taival. Circular Maturity Model. 2020

Table 34. Circular Maturity Level

Level	Description
Level 0 - Inactive	The organization has a lack of awareness, strategic interest or ongoing activities addressing Circular Economy. Circular Economy knowledge and know-how is missing within the organization. Legal requirements in that field are just partially fulfilled.
Level 1 - Reactive	Single activities are spontaneously adapted towards circularity reacting to external impulses (e.g., legal requirements or customer demand). However, the strategy has hardly any or no links to the Circular Economy; activities are isolated and not aligned and insights and efforts are not communicated internally or externally. The organization complies with minimum legal requirements.
Level 2 - Active	Circular Economy is mentioned in the overall organization's strategy and an implementation plan is available. Furthermore, circularity goals are set, and employees are aware of their organization's Circular Economy. Activities focus on cost-cutting exercises (e.g., material reduction) and products and services are gradually improved. The organization takes part in external activities to understand stakeholders, learn and share information. Legal requirements are fulfilled.

Level 3 - Established	Circular Economy is integrated in the strategy and processes, which is actively supported by management. All solutions (product, services, and business models) are designed according to Circular Economy principles. Insights and efforts are communicated internally and externally. In addition, functional cooperation with other partners along the value chain drives circular solutions. The legal requirements are met, and stricter guidelines are enforced voluntarily.
Level 4 - Directed	Circularity is embedded in an organization's purpose. The overall Circular Economy strategy is broken down to quantitative objectives for the sustainability performance of processes and used as criteria in the managing processes. Processes are continuously improved through internal collaboration across departments/functions and external collaboration across the value circle network. Success to achieve targets is reported towards stakeholders and partners. The organization is sometimes engaging and upskills employees regarding the Circular Economy, within and beyond the direct scope of their own business. The organization goes beyond the legal requirements and anticipates possible future legislative changes.
Level 5 - Proactive	Organization takes a role as forerunner and drives the Circular Economy forward by actively engaging with sectoral organizations, cross-industrial activities and policy makers. The organization focuses on maximizing ecosystem symbiosis and human well-being. The Circular Economy ecosystem is collaboratively advanced with partners and stakeholders based on a quantitative understanding of the causality and interdependencies of existing processes. The organization engages and upskills people regarding within and beyond the direct scope of their own business. Legal requirements are surpassed, and any subsequent legal changes are anticipated.

Through the combination of self-assessment and value chain analysis, the maturity level of circular economy practices was identified in agriculture, bee farm, food and beverage production, and retail. Consequently, the retail sub-sector is at level 0, the agricultural sub-sector is at level I, and the sub-sectors of food production and beekeeping have partially met the requirements for level II.

Table 35. Maturity level by sub-sectors

Retail **0 level /Inactive/** ✔ No strategic interest in CE ✔ No CE processes ✔ No CE knowledge ✔ Linear business model	**Agriculture** **I level /Reactive/** ✔ Reactions to external impulses ✔ Singles CE activities ✔ No active engagements
Food, water and beverage production **II level /Active/** ✔ CE potential identified × CE strategy and implementation plan is available × SMART CE targets set × CE process managed	**Bee farm** **II level /Active /** ✔ CE potential identified ✔ CE strategy and implementation plan is available × SMART CE targets set × CE process managed

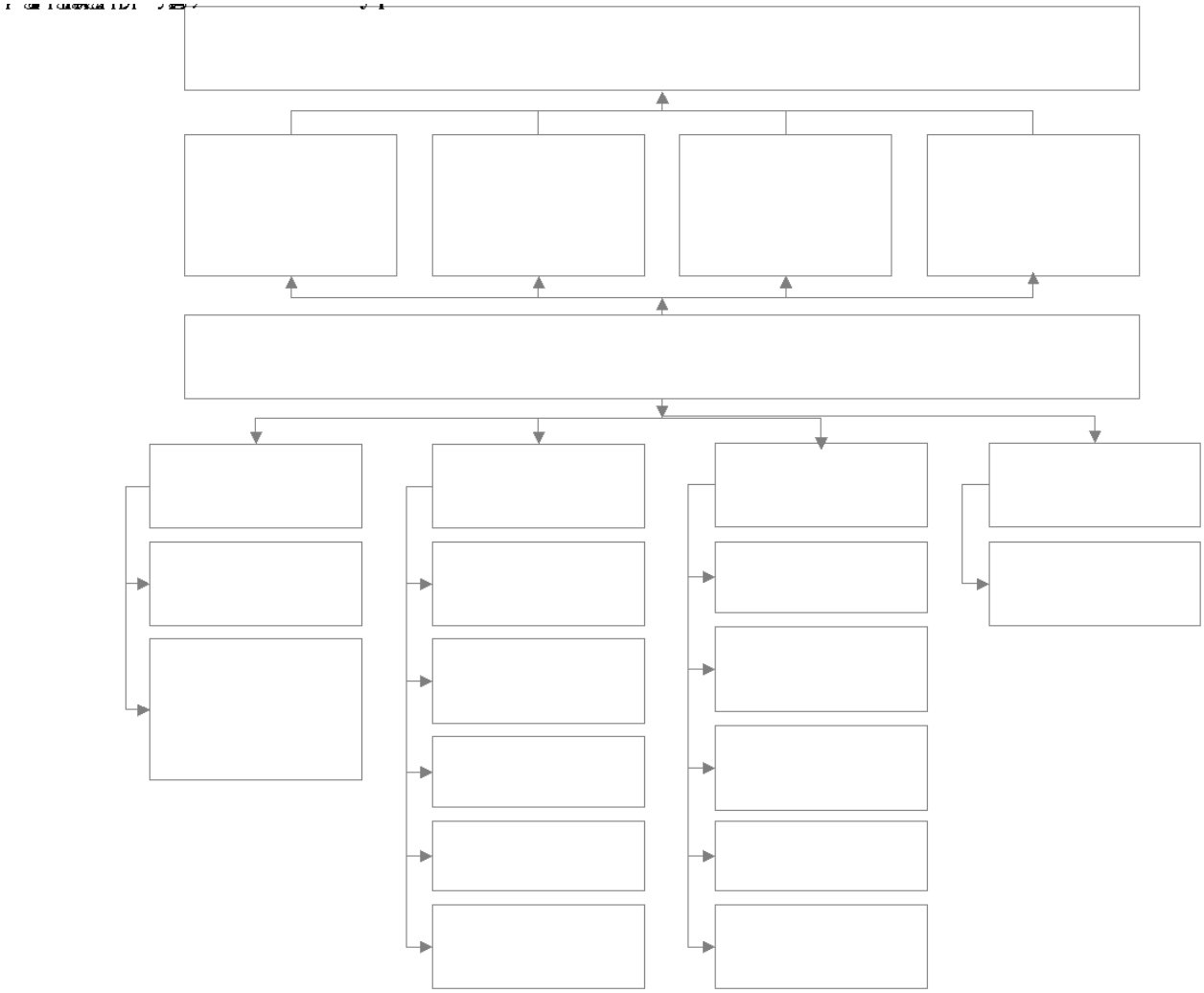
Source: Research team

7.3. Cause and effect

Research and analysis have revealed that not only is CE practice implementation among the MSMEs in our country inadequate, but only three of the 7R principles (Refuse, Reduce, Repair) are being implemented at the elementary level, while the other principles (Rethink/Redesign, Reuse, Remanufacturing, Recycling) have not been introduced yet. A cause-and-effect model has been applied to clarify the reasons for the insufficient penetration of CE practices in MSMEs and illustrated graphically.

The underlying problem is a lack of adequate knowledge and skills, leading to no positive trends in introducing the concept of CE, reusing products, or finding other uses for the products. Taking the findings of the assessment into consideration, the main reasons can be attributed to inadequate recognition, introduction, and implementation of eco-standards, a lack of financial resources, a lack of organizational capacity, and limited knowledge and understanding of CE practices.

Image 19. Cause and effect diagram



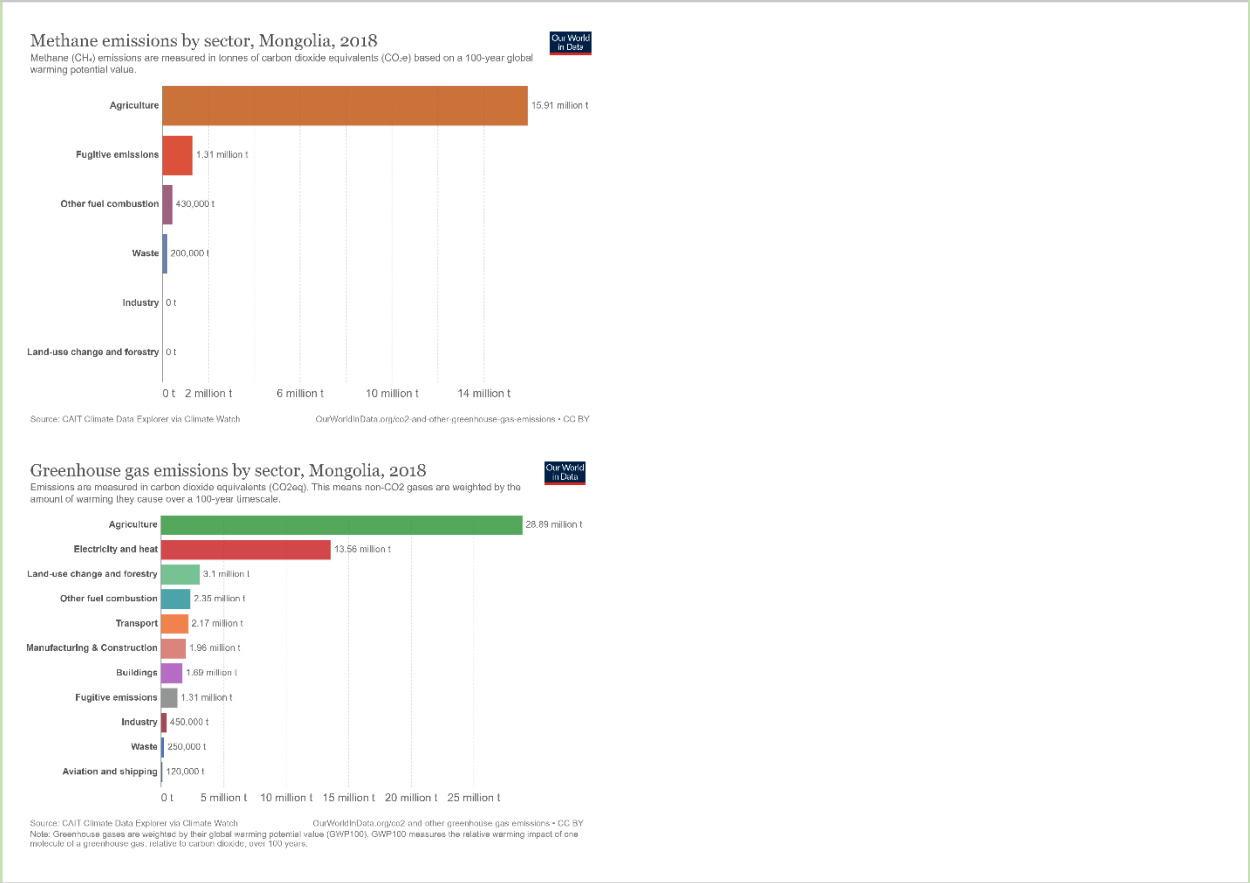
Source: Survey team

8. RECOMMENDATIONS

Agri-Food and Beverage sector recommendations are provided based on the results of an in-depth assessment that is part of a major project objective to reduce greenhouse gas emissions.

Reduce greenhouse gas emissions. Even though Mongolian greenhouse gas emissions account for only 0.05% of the world's total greenhouse gas emissions, Mongolia's per capita greenhouse gas emissions surpass the global average by 2.7 times. Comparing greenhouse gas emissions by sector, it is apparent that the Agriculture sector produces the highest levels of emissions.

Image 20. Methane and Greenhouse Gas Emissions from the Agricultural Sector



Source: World Bank, World Carbon Project

In the "Nationally Determined Contribution" document, the government of Mongolia revised the previous goal of reducing greenhouse gas emissions to 22.7% by 2030, and if absorption is added, the goal of reducing greenhouse gas emissions is 38.4%.

As indicated in the National Level of Contribution Document, the Government of Mongolia has revised its previous GHG reduction target to 22.7% by 2030, and if absorption is included, the reduction target will be 38.4%. By this, the Government of Mongolia approved the document "National Goals for the Implementation of the Paris Agreement" by Decree No. 407 issued in November 2019.

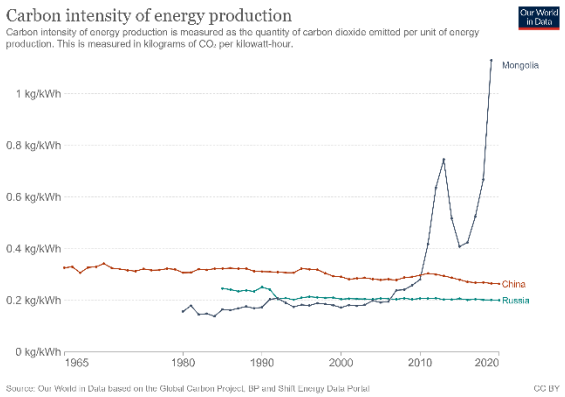
Based on international methodologies, this document examines the possible ways to reduce greenhouse gas emissions in both the energy sector and the non-energy sector. In the energy sector, energy production and energy consumption in industry, construction, road transport, and agriculture were considered, while in the non-energy sector, agriculture, industrial process, product consumption, and waste sectors were evaluated.

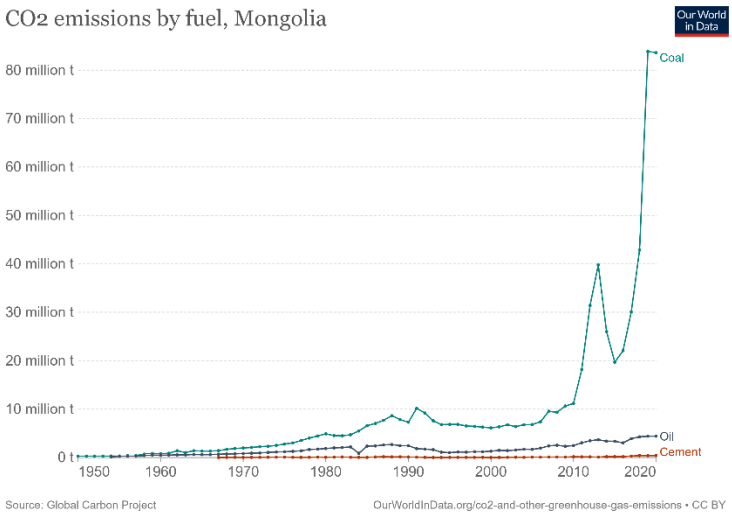
Recommendation 1: The energy sector

It is imperative to reduce the consumption of energy as it contributes to a large portion of greenhouse gas emissions. Policy documents such as "Sustainable Development Concept of Mongolia-2030", "State Energy Policy", and "Green Development Policy" include policies, programs, and measures aimed at reducing climate change in the energy industry. Within the framework of the "Medium-term National Program for the Implementation of the State Energy Policy (2018-2023), the "State Energy Policy" includes the introduction of new methods and technologies to produce heat and electricity, as well as the introduction of renewable energy sources. Energy policy focuses primarily on heat and power plants, which may not contribute significantly to GHG reduction, as GHG can be reduced either by using less energy or by using energy that produces fewer greenhouse gasses.

In the context of the first method, if we take the Energy Intensity indicator into account, which measures the amount of energy consumed per unit of GDP, the picture suggests that our country consumes energy sparingly. In other words, it is a measure of how efficiently energy is used in the production of goods. In contrast, if we look at indicators of carbon intensity or the amount of CO2 emitted per unit of energy, our country scores significantly higher. When taking into consideration the ratio of energy sources, coal is the primary source of carbon dioxide emissions.

Image 21. Energy Intensity and Carbon Intensity





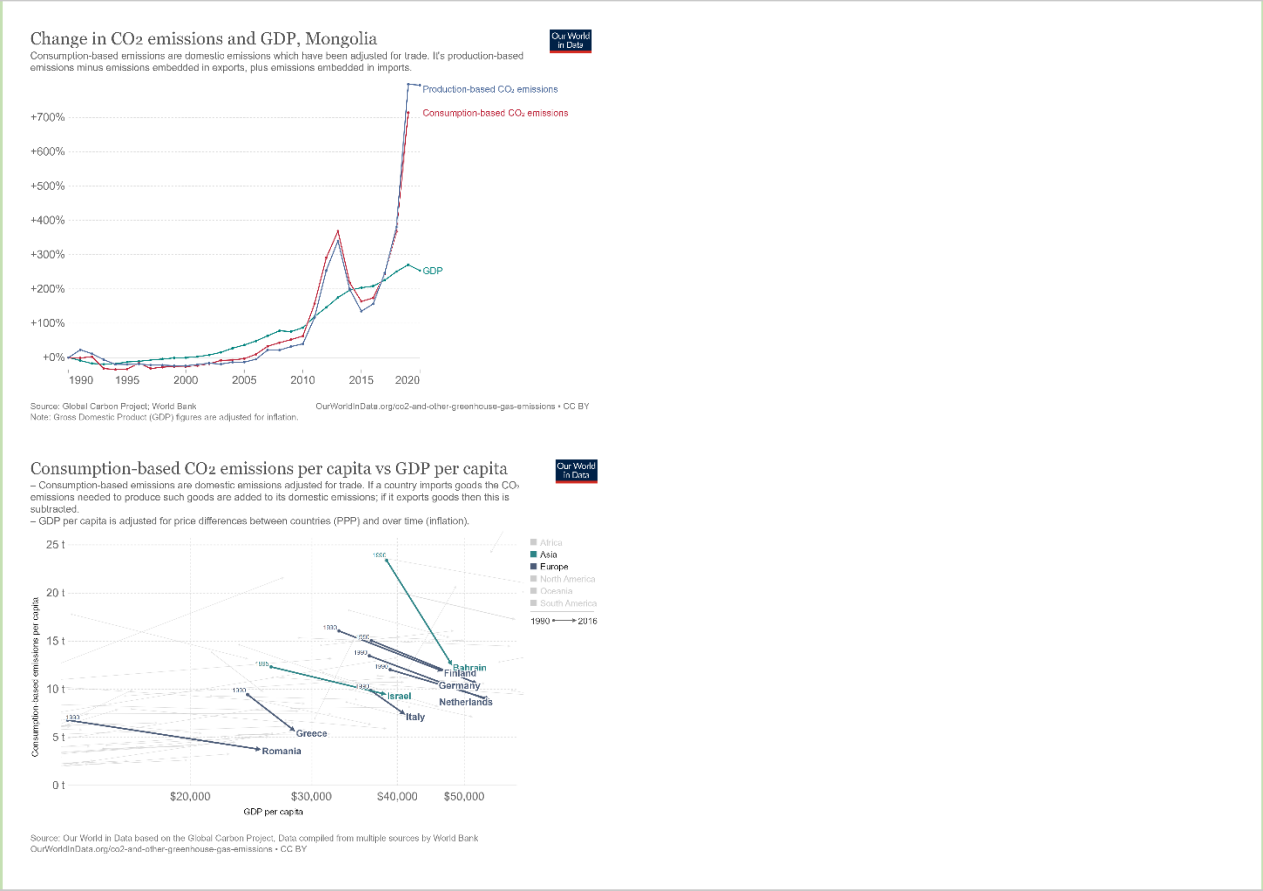
Source: World Bank, World Carbon Project

GDP growth should be two times as high as the growth rate of greenhouse gas emissions, and Bahrain, Italy, and Greece are leading the way with the experience of improving the ratio.

When countries measure greenhouse gas emissions, they often calculate production-based emissions, or carbon dioxide emissions within their borders, rather than considering emissions

from imported goods manufactured elsewhere. Our country's toxic emissions from domestic production increased by 796% in 2020, while those from imported goods increased by 714%.

Image 22. Emission of carbon dioxide



To reduce the amount of carbon emitted per unit of energy for our country it is recommended:

- Shifting energy generation to low-carbon sources (such as renewable energy or nuclear power etc.);
- Reducing the consumption of coal used for power generation.

Observations from the in-depth assessment in the agro-food and beverage sector indicate that MSMEs in our country do not adopt the practice to utilize greywater, renewable energy, energy-efficient equipment, or electric machinery. It is therefore essential that training, methodological recommendations, technical assistance, and solutions are provided to Mongolia's SMEs to reduce its greenhouse gas emissions.

Recommendation 2. Cooperation

International best practices show that it is important to change the attitude of the management and employees of the organization (Rethinking/Redesign) to change business models, products,

services, and technologies to make it more environmentally friendly. As well as it can be seen that conditions for cooperation and encouragement should be created to gain more commitment. According to the results of the self-assessment, there was weak cooperation in the introduction of the value chain of MSMEs in our country, including the implementation of circular economy practices. However, introducing the concept of CE requires comprehensive and extensive active cooperation. In addition, there is a challenge to create new sources of business income, update the design of products and services, and most importantly, strengthen cooperation in the value chain and use renewable energy as well as natural resources wisely.

A collaborative approach to carbon reduction is illustrated in the following example. By the results of the self-assessment, Ulaanbaatar accounts for 50% of all sales in the agrifood and beverage sector. The distance between Sukhbaatar, the capital of Selenge province, and Ulaanbaatar is 327 kilometers, making the two-way distance 654 kilometers. A car that consumes 14 km per liter of petrol will consume a total of 46.7 liters of petrol, which will emit 0.11mt1[56] CO_2. If 10 MSMEs from Sukhbaatar Soum transport goods to Ulaanbaatar city, the cost of the fuel will be 1,005,473 MNT for 420.7 liters (assuming gasoline is 2,390 MNT per liter). Furthermore, it will be possible to reduce the emission of 0.99 mt CO_2 as well as driver's fee, accommodation, and food costs in Ulaanbaatar.

The Circular Economy report recommends 21 strategies[57] for businesses to implement that can contribute to deeper and more fundamental economic transformation by limiting greenhouse gas emissions. For instance: Strategies such as organic food, consumption of locally produced products, and certification are estimated to reduce emissions by 2.07 gt CO_2. Therefore, it is possible to choose from the strategies and use them in project activities.

Recommendation 3. Training and counseling services

The participants who took part in the research are at the 0th and 1st levels of Circular Economy maturity level. The main goal of the project is to empower and develop these entrepreneurs. For this purpose, it is expected that the organization involved in the project will be able to show the results of the project in identifying and comparing the levels achieved before and after the training and counseling services of MSMEs by using the Circular Economy Maturity Model. In addition, after identifying the accurate basic level, it will become possible to identify suitable training content and methods for each individual.

For instance: Retailer sub-sector participants at *level 0* have no interest in the "Circular Economy" strategy, they have no circular economy experience, no circular economy knowledge, and have a linear business model. To bring them to level I, it is optimal to provide training and counseling services aimed at implementing at least one of the Circular Economy practices,

[56] Greenhouse Gas Equivalencies Calculator, https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator
[57] The Circularity Gap Report, 2022

increasing awareness, orienting the organization's strategy and goals to Circular Economy, and revising the business model. It also can be implemented from the experiences to reduce, reuse, repair, and recycle the inputs. For example, the following experiences can be mentioned: (i) development of rainwater and greywater harvesting and irrigation systems; (ii) reduction of energy use, use of renewable energy, and reduction of heat loss, (iii) shared use and maintenance of equipment and tools (iv) Sorting, collecting, recycling and utilizing of agricultural and food waste.

Recommendation 4. Green certification processing

The process of obtaining a mark for organic products in our country has multi-step and relatively complicated, which requires time and persistence. On the other hand, due to insufficient knowledge and information in this field and the unavailability of technological skills, food producers are not able to access the database of organic food products.

Considering the poor technical and technological capabilities of the MSMEs in the Agri-food and beverage sector, a lack of human resources, and limited financial capacity, it is advisable to implement the Green Certificate process in a simple, easy and understandable manner. As the certification activities will be carried out electronically, it will be necessary to conduct training and consulting sessions to develop the participants' digital skills, as well as to map the certification process, explain how it is recorded and printed, and introduce mentorship programs.

Recommendation 5. Activities to increase public awareness and promote

It is important to encourage environmentally friendly practices and increase public awareness and understanding to provide both incentives to purchase and, in turn, increase the demands placed on manufacturers. Therefore, it is possible to implement the following promotional activities to increase public awareness.

Table 36. Activities to increase public awareness and promote

Goal	Activities to increase public awareness and promote	Collaborative organization
A joint solution	Academic conferences among university students	Universities
	Conference and workshop between value chain stakeholders	MSMEs, business associates and agricultural organizations of Ulaanbaatar and Erdenet city, Selenge and Umnugovi provinces

	Discussion on policy and legal framework of green economy	MoFALI, Ministry of Environment and Tourism (MoET), MNCCI
Public awareness	Celebrating the International Day on Food Waste announced by the United Nations General Assembly (September 29)	MoFALI, MoET, UN
Provide knowledge	Organize environmentally friendly training for teenagers	Ministry of Education and Science, General education schools of the capital and province
	Deliver video content on Circular Economy through social networks	

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10. ANNEX

10.1. Outputs of in-depth assessment

1. Agri-food and beverage sector market assessment
1.1 Examine agri-food and beverage businesses */legal status, structure, and human resource capabilities of MSMEs in Ulaanbaatar, Erdenet city and Selenge and Umnugovi provinces/*
1.2 The current situation of the agri-food and beverage sector and sub-sector */e.g., suppliers, agriculture and agricultural processors, manufacturers, producers, wholesale and retail traders/*
1.3 IDENTIFY agri-food and beverage sectors and sub-sector with higher growth potential with level of green business
1.4 IDENTIFY gaps for production, agricultural extension, procurement of inputs, marketing, financial services, capacity building, value chain development including warehousing, and logistics;
1.5 QUANTIFY the overall market financing needs and DEFINE barriers of MSMEs in the Agri-food and beverage sector. *Assess whether MSMEs face restricted access to any financial services from financial institutions, under what circumstances such barriers are placed and whether these differ by sectors.*
2. Capacity assessment of agri-food and beverage industry on green labeling and circular economy
2.1 DETERMINE the level of understanding of the concept of green labeling and capacities to introduce circular economy practices and needs;
2.2 IDENTIFY gaps for improvements or lessons learned from the current circular economy practices and country's green development action plan;
2.3 IDENTIFY Areas of capacity development (including energy, water and resource efficiency practices, use of transport, use of packaging, food waste, etc.) for MSMEs to introduce circular economy practices and green labelling;
2.4 Review international circular/green economy practices and identify the best circular economy practice;
2.5. PROVIDE structured guidance and recommendations for Mongolian agri-food and beverage sector to adopt circular business/economy practices
3. Identify the most potential sub-sectors to practice the circular economy and green labelling
3.1 IDENTIFY priority sectors, taking into account their contribution to economy, employment creation, market capacity, and efficient use of resources;
3.2 Conduct value chain analysis for each sub-sector. *The value chain analysis will entail: each sector's specific production profiles (e.g stages of production, transportation and storage, resource); value chain mapping (key stakeholders, flow of supplies and products, flow of funds and information, etc.); functional analysis of each value chain (profiling of industry structure, adoption*

of new practices, technology and innovation); economic analysis of potential opportunities to introduce circular practices to the value chains and stages of production;
3.3 MAP OUT the current geographic and sectoral distribution of MSMEs within the project area;
3.4 IDENTIDY the most significant value chains or types of production that requires circular business/economy practices and further investigate the bottleneck in the value chain in pre-selected subsectors;
3.5 Undertake a desk review of relevant activities conducted by government or other development partners on the selected value chains;

10.2. Self-assessment questionnaire of Agriculture

SELF-ASSESSMENT QUESTIONNAIRE OF AGRICULTURAL FARMERS

Number: .....

This section should be completed by the data collector:

Date and time of data collection	Year …… month …… date ……. Started at .....:..... Finished at …...:.....
Location of the data collection	…… ……
Data collector's number	……

Hello, Dear survey respondent. We would like to extend our appreciation to you.

We are conducting the survey to determine the current situation, experience, facing challenges, training and financial needs of organization in the field of agro-food industry to cultivate, produce and to sell eco-friendly products. The results of the survey will be used to support the micro, small and medium scale producers and traders. Therefore, we kindly ask you to answer the questions accurately and completely.

1. *This questionnaire consists of 5 sections.*
2. *This questionnaire will take 15-20 minutes approximately.*
3. *Please, read each question and mark the most appropriate answer.*

Your personal and company information will remain strictly confidential in accordance with code of conduct for responsible research

SECTION 1. GENERAL INFORMATION

1. **What kind of operation does your company carry on? /you can choose multi answers/**
   - ☐ A grain
   - ☐ Potatoes and other veggies
   - ☐ Greens/ vegetables
   - ☐ Oil plants
   - ☐ Feeds
   - ☐ Fruits
   - ☐ Others */ please write /* .....
2. **The ownership type of your organization?**
   - ☐ Domestic investment
   - ☐ Foreign investment
   - ☐ Mixed /joint venture/
3. **What type of category does your organization belong to?**
   - ☐ Family-owned and individual business
   - ☐ Limited liability company
   - ☐ Partnership company
   - ☐ Community based
   - ☐ Open joint-stock company
   - ☐ Closes joint company
4. **How many years has your organization been running?**
   - ☐ Up to 1 year
   - ☐ 1-5 years
   - ☐ 6-10 years
   - ☐ 11-15 years
   - ☐ 16-20 years
   - ☐ 21 years and above that
5. **How many employees does your company have?**
   - ☐ 1-10 employees
   - ☐ 11-30 employees
   - ☐ 31-50 employees
   - ☐ 51-200 employees
   - ☐ 201 employes and above that
6. **What is the average annual income of you company?**
   - ☐ Up to 99 million
   - ☐ 100-299 million
   - ☐ 300 million -1 billion
   - ☐ 1-2,5 billion
   - ☐ 2.5 billion and above that
7. **Please rate the general situation of Mongolian production industry** ***/please choose only one answer for each row/***

Please rate each one	Good	Reasonable	Bad	Very bad	Unknown
7.1 Product and service quality	4	3	2	1	0
7.2 Industry competitiveness	4	3	2	1	0
7.3 Producer's knowledge and skills	4	3	2	1	0
7.4 Government support	4	3	2	1	0
7.5 Regulations and standards	4	3	2	1	0
7.6 Technology and innovation	4	3	2	1	0
7.7 Cooperation and partnership	4	3	2	1	0
7.8 Financial resources and possibilities	4	3	2	1	0
7.9 Equipment supplies	4	3	2	1	0
7.10 Consulting services and projects for production	4	3	2	1	0
7.11 Information availability and access	4	3	2	1	0
7.12 Warehousing	4	3	2	1	0
7.13 Sales and distribution	4	3	2	1	0
7.14 Industry marketing	4	3	2	1	0
7.15 Human resource availability	4	3	2	1	0
7.16 Others */please write/*.....	4	3	2	1	0

Continued on next page →

SECTION 2. UNDERSTANDING OF THE ECO-LABEL

8 How well/much do you know about the eco label? /eco-label, organic indication and symbols/

- ☐ Very well
- ☐ Heard of it
- ☐ Never heard of it

***9* How much do you agree with the following factors** */please choose only one answer for each row/*

Please rate each statements	Strongly agree	Agree	Disagree	Strongly disagree	Unknown
9.1. Products should be certified with the eco-label if the norms and rules of being friendly to the environment have been followed in terms of producing process	4	3	2	1	0
9.2. The products with eco-label is a great way of giving information about environmental safety to customers	4	3	2	1	0
9.3. Having a product certified with eco-label makes business more efficient and increases the competitiveness of the company	4	3	2	1	0
9.4. Being certified with eco-label indicates the reliability of the product	4	3	2	1	0
9.5. The implementation of the eco-manufacturing processes by maintaining water and energy efficiency and recycling waste can increase the sales income which improves employee wages and living standards	4	3	2	1	0
9.6 Customers should read and pay attention to the product label	4	3	2	1	0
9.7. Customers should buy products made from recycled materials and reusable packaging	4	3	2	1	0
9.8. Customers should avoid from buying products from companies that are not responsible for the environment	4	3	2	1	0
9.9. Eco production, usage of various renewable energy, waste recycling reduce air pollution	4	3	2	1	0
9.10. Our company should be involved actively with the eco-friendly production activities	4	3	2	1	0

Continued on next page →

SECTION 3. COMPANY'S CURRENT SITUATION ASSESSMENT

10 **Does your company have implemented following standards? / please choose only 1 answer for each line/**

Standards	Yes, it has been implemented	Yes, early stages of implementation	No, but it is planned	No, it is not planned	Not heard of this standards and practices
7.1 МУХАУТ- "Organic product/certified organic" eco label	4	3	2	1	0
7.2 ХХАЛХУЯ- Organic food certificate	4	3	2	1	0
7.3 Organic Mongol Program – Organic product certificate	4	3	2	1	0
7.4 MNS 6737:2018 Good Agricultural Practices	4	3	2	1	0
7.5 ISO 22000 Food safety management system	4	3	2	1	0
7.6 ISO 14001 Environmental Management system	4	3	2	1	0
7.7 Other */please write/*	4	3	2	1	0

11 Does your company follow the any of the environmental responsibility goals and projects implemented in Mongolia? /you can choose multi answers/

- ☐ Sustainable Development Goals of Mongolia
- ☐ Green Development Policy of Mongolia
- ☐ International program and projects
- ☐ Local programs and projects
- ☐ No

12 Does your company have policy documents, plans and programs aiming at developing and implementing environmental friendly agricultural practices?

- ☐ Yes, we have
- ☐ No, we dont have
- ☐ Cannot think of it

13 Does your company have efficiency related indicators to assess environmental safety and sustainability?

- ☐ Yes
- ☐ No
- ☐ Do not know

14 **Does your organization practice the followings?** */please chooes only one answer for each line/*

Please rate each one	Yes	No	Unknown
14.1. Natural organic and bio fertilizers used	2	1	0
14.2. Natural organic and bio grains used	2	1	0
14.3. Organic fertilizers used to increase soil fertility	2	1	0
14.4. Animal dung used for fertilizing	2	1	0
14.5. Natural organic substances for insects, weeds and deceases	2	1	0
14.6. Biodegradable and compost is used	2	1	0
14.7. Packaging made from the recycled materials are used	2	1	0
14.8. Reusable packaging is used			
14.9. Recyclable plastic and bottles are used	2	1	0
14.10. Synthetic cover, wool and nest nettings are used	2	1	0

Continued on next page →

Please rate each one	Yes	No	Unknown
14.11. We implement soil management to keep the soil fertilized biologically	2	1	0
14.12. We use thermal and physical methods against insects and weeds	2	1	0
14.13. Energy efficient equipment is used	2	1	0
14.14. We use vehicles that use less fuel and electricity	2	1	0
14.15. Our equipment is cleaned regularly	2	1	0
14.16. Our equipment is maintained regularly	2	1	0
14.17. We have training on waste management system to collect, sort and recycle	2	1	0
14.18. We use rainwater and grey water	2	1	0
14.19. Traditional and organic products are kept separately	2	1	0
14.20. We plant and regenerate trees	2	1	0
14.21. A separate line is created with different type of fertilizers for a various crops	2	1	0
14.22. We keep records of substances used to control insect, pests and weeds	2	1	0
14.23. A Post sign is posted about the presence of chemicals used for fertilizing	2	1	0

15 **How do you manage waste generated during the harvesting process?** */you can choose multi answers/*

- ☐ Makes compost for fertility
- ☐ It is destroyed by burning
- ☐ Used for land filling
- ☐ Used as feed for animals
- ☐ Will be sold
- ☐ Throw away without processing
- ☐ Do not know

16 ***Where does your organization buy raw materials /bio fertilizer, grain, and substance supplies from? /you can choose multi answers/***

- ☐ We make ourselves
- ☐ We import from abroad
- ☐ From importing companies
- ☐ From the domestic producers
- ☐ From wholesalers and retailers

17. Does your organization cooperate with other farmers and individuals? ***/please choose only one answer for each line***

Please rate each one	Yes	No	Unknown
17.1. Soil preparation	2	1	0
17.2. Plantation	2	1	0
17.3. Harvesting	2	1	0
17.4. Warehousing	2	1	0
17.5. Logistics	2	1	0
17.6. Training and consulting	2	1	0
17.7. Sales and marketing	2	1	0
17.8. Financing	2	1	0

18. Where does your company sell your products? ***/you can choose multi answers/***

- ☐ Sells to local market
- ☐ Sold in Ulaanbaatar city
- ☐ We export

19. Who does your company sell your products to? ***/you can choose multi answers/***

- ☐ To retailers
- ☐ To wholesalers
- ☐ To commercial food service companies
- ☐ To processing companies
- ☐ To dealers
- ☐ To customers
- ☐ To partnership and community groups

Continued on next page →

20. **What are the difficulties and challenges in implementing environmental concerned plantation in your organization?** ***/you can choose multi answers/***

- ☐ The support from the upper management level
- ☐ Lack of knowledge, skills and experience of management team and employees
- ☐ Lack of financial resources
- ☐ Number of suppliers is limited
- ☐ Short term and unstable political change
- ☐ Operating cost is high
- ☐ There is no supplier in Mongolia
- ☐ Lack of information
- ☐ Don't know what to do and where to start
- ☐ Other */please write/* .....

21. **How is the use of digital platform and technologies in your operation?** */please choose only one answer for each line/*

Please rate each one	Very well used	Started to use	Planning to use	Not planned to use	Do not know about it
21.1 Digital technology used daily in operations. /e-mail, intranet, software.../	4	3	2	1	0
21.2 Digital technology used to save time and expenses /digital platform service, e-taxing report and remote monitoring…/	4	3	2	1	0
21.3 Digitalize documents and digital archiving used	4	3	2	1	0
21.4 Digital platform to organize meetings online /google meet, skype, zoom.../	4	3	2	1	0
21.5 Support from company to work from home for employees	4	3	2	1	0

22. **Please rate your company's readiness to develop eco-freindly and environmentally safe plantation with following capabilities.** */please choose only one answer for each factors/*

Please rate each one	Fully capable of developing	Needs to be improved	Poor capability	Not ready at all	Do not know
22.1 Tangible assets /Building, facility, property/	4	3	2	1	0
22.2 Technology, know-how, equipment	4	3	2	1	0
22.3 Financial capability	4	3	2	1	0
22.4 Land	4	3	2	1	0
22.5 Patent	4	3	2	1	0
22.6 Organizational culture to encourage eco practices	4	3	2	1	0
22.7 Company's prestige, image and recognition	4	3	2	1	0
22.8 Enough number of employees and well trained human resources	4	3	2	1	0
22.9 Organizational management, strategy and objectives	4	3	2	1	0
22.10 Well participation in regular training	4	3	2	1	0
22.11 Adoption of information technology	4	3	2	1	0
22.12 Capable of doing research and its analysis	4	3	2	1	0
22.13 Partnership and cooperation	4	3	2	1	0
22.14. Other */please write/*.....	4	3	2	1	0

Continued on next page →

SECTION 4. TRAINING AND FINANCIAL NEEDS

23. Does your company need training and consulting services to develop the 'environmentally friendly plantation and harvesting? */please choose only one answer for each statement/*

Please rate each one	Yes	No	Do not know
23.1 Eco-friendly production, adoption of standarts and getting certificated	2	1	0
23.2 Use of renewable energy	2	1	0
23.3 Energy efficient technology	2	1	0
23.4 Reducing soil pollution and improving air quality	2	1	0
23.5 Technology to reduce water consumption and reuse of greywater and rainwater	2	1	0
23.6 Waste management to collect, sort and recycle	2	1	0
23.7 Know-how and new technology	2	1	0
23.8 Sales and marketing	2	1	0
23.9 Agricultural extension services	2	1	0
23.10 Human resource management	2	1	0
23.11 Financial management	2	1	0
23.12 Other */please write...../*	2	1	0

24. What type of additional financial resources does your company need to develop the 'environmentally friendly plantation and harvesting? */please choose only one answer for each statement/*

- ☐ Bank loan
- ☐ Project loan
- ☐ Government discounted loan
- ☐ Non-bank financial organization's loan
- ☐ Grants from international organization
- ☐ Share offering at market
- ☐ Not necessary at the moment
- ☐ Other .....

25. Please specify the amount of loan / financing required. ..... tugrug.

26. Do you have a feasibility study of environmental friendly plantation and harvesting project that needs financing?

- ☐ Yes
- ☐ No

***27.* What are the challenges facing in obtaining finance?** */you can choose multi answer/*

- ☐ To write project
- ☐ Loan collateral
- ☐ Loan guarantor
- ☐ Loan interest rate and term
- ☐ Loan availablitity

28. Would your organization participate in the mentorship program which designed to your needs to help you to develop the environmentally friendly plantation and harvesting?

☐ Yes ☐ No **Maybe**

29. Does your organization have a website?

☐ Yes ☐ No

30. Would you be able to apply using online platform to get an eco-label?

☐ Yes ☐ Do not know

☐ No ☐

31. In your opinion, what do you think should be implemented as very first thing for the environmentally friendly plantation and harvesting?

.....

.....

.....

Continued on next page→

SECTION 5. PROFILE QUESTIONS

Your personal information will be comfidential. We kindly ask you to fill in it in accurately.

32. Age	☐ 15-19	☐ 20-29	☐ 30-39	☐ 40-49
	☐ 50-59	☐ 60 and above that		
33. Gender	☐ Male	☐ Female		
34. Education	☐ Uneducated	☐ Elementary school	☐ Incomplete secondary education	☐ Completed secondary education
	☐ Bachelor	☐ Master	☐ Doctor / Phd	
35. Position	☐ Director	☐ Owner	☐ Member of family owned business	☐ Manager
	☐ Employee			
36. Years of work experience for this company	☐ Up to 1 year	☐ 1-5 years	☐ 6-10 years	☐ 11-15 years
	☐ 16-20 years	21 years and above that		
37. Number of people involved in household business / company	☐ 1-2	☐ 3-4	☐ 4-5	☐ 6 and above that
38. Size of plantation site/land	.....			
39. Harvesting output per year	*/by each product output/*			
40. Location of plantation site/land	*/please write full address /*			
41. Ownership of plantation site/land	☐ Own	☐ Lease	☐ Other	
42. How far /km/ is your site from the urban areas?	.....			

43. Would you like to participate for the FREE training and consulting services as part of "Green transition of economy" project to be implemented in Mongolia in 2022-2025 funded by the European Union's Switch Asia program?

- ☐ Yes
- ☐ No
- ☐ Maybe

Please leave your contact information for future activities of the projects to be updated.

Name of the organization (name and surname if an individual):.....

Phone number: .....

E-Mail address: .....

Thank you for you inputs to our research. Thank you so much for your valuable time.
We wish you the best.

10.3. Self-assessment questionnaire of Beekeeping

SELF-ASSESSMENT QUESTIONNAIRE OF BEEKEEPERS

Number: .....

This section should be completed by the data collector:

Date and time of data collection	Year …… month …… date ……. Started at .....:..... Finished at …..:.....
Location of the data collection	....
Data collector's number	.....

Hello, Dear survey respondent. We would like to extend our appreciation to you.

We are conducting the survey to determine the current situation, experience, facing challenges, training and financial needs of organization in the field of agro-food industry to cultivate, produce and to sell eco-friendly products. The results of the survey will be used to support the micro, small and medium scale producers and traders. Therefore, we kindly ask you to answer the questions accurately and completely.

1. *This questionnaire consists of 5 sections.*
2. *This questionnaire will take 15-20 minutes approximately.*
3. *Please, read each question and mark the most appropriate answer.*

Your personal and company information will remain strictly confidential in accordance with code of conduct for responsible research.

SECTION 1. GENERAL INFORMATION

1. What kind of operation does your company carry on? /you can choose multi answers/

- ☐ Bee breeding
- ☐ Beekeeping
- ☐ Production
- ☐ Sales
- ☐ Warehousing
- ☐ Logistics
- ☐ Food production and services
- ☐ Others */ please write /* .....

2. The ownership type of your organization?

- ☐ Domestic investment
- ☐ Foreign investment
- ☐ Mixed /joint venture/

3. What type of category does your organization belong to?

- ☐ Family-owned and individual business
- ☐ Limited liability company
- ☐ Partnership company
- ☐ Community based
- ☐ Open joint-stock company
- ☐ Closes joint company

4. How many years has your organization been running?

- ☐ Up to 1 year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ 21 years and above that

5. How many employees does your company have?

- ☐ 1-10 employees
- ☐ 11-30 employees
- ☐ 31-50 employees
- ☐ 51-200 employees
- ☐ 201 employes and above that

6. What is the average annual income of you company?

- ☐ Up to 99 million
- ☐ 100-299 million
- ☐ 300 million -1 billion
- ☐ 1-2,5 billion
- ☐ 2.5 billion and above that

7. Please rate the general situation of Mongolian production industry ***/please choose only one answer for each row/***

Please rate each one	Good	Reasonable	Bad	Very bad	Unknown
1. Product and service quality	4	3	2	1	0
2. Industry competitiveness	4	3	2	1	0
3. Producer's knowledge and skills	4	3	2	1	0
4. Government support	4	3	2	1	0
5. Regulations and standards	4	3	2	1	0
6. Technology and innovation	4	3	2	1	0
7. Cooperation and partnership	4	3	2	1	0
8. Financial resources and possibilities	4	3	2	1	0
9. Equipment supplies	4	3	2	1	0
10. Consulting services and projects for production	4	3	2	1	0
11. Information availability and access	4	3	2	1	0
12. Warehousing	4	3	2	1	0
13. Sales and distribution	4	3	2	1	0
14. Industry marketing	4	3	2	1	0
15. Human resource availability	4	3	2	1	0
16. Others */please write/*	4	3	2	1	0

Continued on next page →

SECTION 2. THE UNDERSTANDING OF THE GREEN LABEL

8. How well/much do you know about the eco label? /eco-label, organic indication and symbols/

- ☐ Very well
- ☐ Heard of it
- ☐ Never heard of it

9. How much do you agree with the following factors */please choose only one answer for each row/*

Please rate each statements	Strongly agree	Agree	Disagree	Strongly disagree	Unknown
9.1. Products should be certified with the eco-label if the norms and rules of being friendly to the environment have been followed in terms of producing process	4	3	2	1	0
9.2. The products with eco-label is a great way of giving information about environmental safety to customers	4	3	2	1	0
9.3. Having a product certified with eco-label makes business more efficient and increases the competitiveness of the company	4	3	2	1	0
9.4. Being certified with eco-label indicates the reliability of the product	4	3	2	1	0
9.5. The implementation of the eco-manufacturing processes by maintaining water and energy efficiency and recycling waste can increase the sales income which improves employee wages and living standards	4	3	2	1	0
9.6 Customers should read and pay attention to the product label	4	3	2	1	0
9.7. Customers should buy products made from recycled materials and reusable packaging	4	3	2	1	0
9.8. Customers should avoid from buying products from companies that are not responsible for the environment	4	3	2	1	0
9.9. Eco production, usage of various renewable energy, waste recycling reduce air pollution	4	3	2	1	0
9.10. Our company should be involved actively with the eco-friendly production activities	4	3	2	1	0

Continued on next page →

SECTION 3. COMPANY'S CURRENT SITUATION ASSESSMENT

10. Does your company have implemented following standards? / please choose only 1 answer for each line/

	Standards	Yes, it has been implemented	Yes, early stages of implementation	No, but it is planned	No, it is not planned	Not heard of this standards and practices
1.	MYXAYT- "Organic product/certified organic" eco label	4	3	2	1	0
2.	ХХАЛХУЯ- Organic food certificate	4	3	2	1	0
3.	Organic Mongol Program – Organic product certificate	4	3	2	1	0
4.	MNS 6737:2018 Good Agricultural Practices	4	3	2	1	0
5.	ISO 22000 Food safety management system	4	3	2	1	0
6.	ISO 14001 Environmental Management system	4	3	2	1	0
7.	Other */please write/*	4	3	2	1	0

11. Does your company follow the any of the environmental responsibility goals and projects implemented in Mongolia? /you can choose multi answers/

- ☐ Sustainable Development Goals of Mongolia
- ☐ Green Development Policy of Mongolia
- ☐ International program and projects
- ☐ Local programs and projects
- ☐ No

12. Does your company have policy documents, plans and programs aiming at developing and implementing environmental friendly beekeeping practices?

- ☐ Yes, we have
- ☐ No, we dont have
- ☐ Cannot think of it

13. Does your company have efficiency related indicators to assess environmental safety and sustainability?

- ☐ Yes
- ☐ No
- ☐ Do not know

14. Does your organization practice the followings? */please chooes only one answer for each line/*

	Please rate each one	Yes	No	Unknown
1.	We have well tolerated bee breed	2	1	0
2.	We have an appropriate method to combat deceases and infection prevention practices	2	1	0
3.	We use organic honey and sugar syrup feeds	2	1	0
4.	We are located within a 3km organic farming	2	1	0
5.	Herbal medicine products are used	2	1	0
6.	Natural materials are used to make beehives	2	1	0
7.	Animal dung and manure smoke used	2	1	0
8.	We keep records of beekeeping, processing and storing for controlling	2	1	0
9.	We use packaging made from the recycled materials	2	1	0
10.	We use reusable packaging	2	1	0
11.	We use recyclable packaging	2	1	0

Continued on next pageð →

	Please rate each one	Yes	No	Unknown
12.	We take back product packaging	2	1	0
13.	We use energy efficient equipment	2	1	0
14.	We use vehicles that use less fuel and electricity	2	1	0
15.	We do our cleaning regularly	2	1	0
16.	We do our repairing services regularly	2	1	0
17.	Our company has a training for employees on waste management system to collect, sort and recycle	2	1	0
18.	We use rainwater and greywater	2	1	0
19.	Chemical contained and organic products are kept separately	2	1	0
20.	A Post sign is posted about the presence of chemicals used for agro-processing	2	1	0

15. Where does your organization buy raw materials and supplies from? ***/you can choose multi answers/***

- ☐ We supply ourselves
- ☐ We import from abroad
- ☐ From importing companies
- ☐ From the domestic producers
- ☐ From wholesalers and retailers

16. Does your organization cooperate with other beekeepers and individuals? */please choose only one answer for each line*

Please rate each one	Yes	No	Unknown
16.1. Bee breeders	2	1	0
16.2. Hibernation site	2	1	0
16.3. Equipment suppliers	2	1	0
16.4. Warehousing	2	1	0
16.5. Logistics	2	1	0
16.6. Training and consulting	2	1	0
16.7. Sales and marketing	2	1	0
16.8. Financing	2	1	0
16.9. Other ……..			

17. Where does your company sell your honey products? ***/you can choose multi answers/***

☐ Sells to local market ☐ Sold in Ulaanbaatar city ☐ We export

18. Who does your company sell your products to? ***/you can choose multi answers/***

- ☐ To retailers
- ☐ To wholesalers
- ☐ To commercial food service companies
- ☐ To processing companies
- ☐ To dealers
- ☐ To customers
- ☐ To partnership and community groups

19. What do you use for keeping and storing honey? */you can choose multi answers/*

- ☐ Wooden barrel
- ☐ Plastic food container
- ☐ Glass
- ☐ Can
- ☐ Other */please write/*.....

Continued on next page→

20. What are the difficulties and challenges in implementing environmental concerned beekeeping in your organization? ***/you can choose multi answers/***

- ☐ The support from the upper management level
- ☐ Lack of knowledge, skills and experience of management team and employees
- ☐ Lack of financial resources
- ☐ Number of suppliers is limited
- ☐ Short term and unstable political change
- ☐ Operating cost is high
- ☐ There is no supplier in Mongolia
- ☐ Lack of information
- ☐ Don't know what to do and where to start
- ☐ Other */please write/*
  .....

21. How is the use of digital platform and technologies in your operation? */please choose only one answer for each line/*

Please rate each one	Very well used	Started to use	Planning to use	Not planned to use	Do not know about it
21.1 Digital technology used daily in operations. /e-mail, intranet, software.../	4	3	2	1	0
21.2 Digital technology used to save time and expenses /digital platform service, e-taxing report and remote monitoring…/	4	3	2	1	0
21.3 Digitalize documents and digital archiving used	4	3	2	1	0
21.4 Digital platform to organize meetings online /google meet, skype, zoom.../	4	3	2	1	0
21.5 Support from company to work from home for employees	4	3	2	1	0

22. Please rate your company's readiness to develop eco-freindly and environmentally safe production with following capabilities. */please choose only one answer for each factors/*

Please rate each one	Fully capable of developing	Needs to be improved	Poor capability	Not ready at all	Do not know
22.1 Tangible assets /Building, facility, property/	4	3	2	1	0
22.2 Technology, know-how, equipment	4	3	2	1	0
22.3 Financial capability	4	3	2	1	0
22.4 Land	4	3	2	1	0
22.5 Patent	4	3	2	1	0
22.6 Organizational culture to encourage eco practices	4	3	2	1	0
22.7 Company's prestige, image and recognition	4	3	2	1	0
22.8 Enough number of employees and well trained human resources	4	3	2	1	0
22.9 Organizational management, strategy and objectives	4	3	2	1	0
22.10 Well participation in regular training	4	3	2	1	0
22.11 Adoption of information technology	4	3	2	1	0
22.12 Capable of doing research and its analysis	4	3	2	1	0
22.13 Partnership and cooperation	4	3	2	1	0
22.14 Other */please write/*.....	4	3	2	1	0

Continued on next page→

SECTION 4. TRAINING AND FINANCIAL NEEDS

23. Does your company need training and consulting services to develop the 'environmentally friendly beekeeping? */please choose only one answer for each statement/*

	Please rate each one	Yes	No	Do not know
23.1	Eco-friendly production, adoption of standarts and getting certificated	2	1	0
23.2	Use of renewable energy	2	1	0
23.3	Energy efficient technology	2	1	0
23.4	Reducing soil pollution and improving air quality	2	1	0
23.5	Technology to reduce water consumption and reuse of greywater and rainwater	2	1	0
23.6	Waste management to collect, sort and recycle	2	1	0
23.7	Know-how and new technology	2	1	0
23.8	Sales and marketing	2	1	0
23.9	Agricultural extension services	2	1	0
23.10	Human resource management	2	1	0
23.11	Financial management	2	1	0
23.12	Other */please write...../*	2	1	0

24. What type of additional financial resources does your company need to develop the 'environmentally friendly beekeeping? */please choose only one answer for each statement/*

- ☐ Bank loan
- ☐ Project loan
- ☐ Government discounted loan
- ☐ Non-bank financial organization's loan
- ☐ Grants from international organization
- ☐ Share offering at market
- ☐ Not necessary at the moment
- ☐ Other .....

25. Please specify the amount of loan / financing required. ..... tugrug.

26. Do you have a feasibility study of environmental friendly beekeeping project that needs financing?

☐ Yes ☐ No

27. What are the challenges facing in obtaining finance? */you can choose multi answer/*

- ☐ To write project
- ☐ Loan collateral
- ☐ Loan guarantor
- ☐ Loan interest rate and term
- ☐ Loan availablitity

28. Would your organization participate in the mentorship program which designed to your needs to help you to develop the environmentally friendly beekeeping?

☐ Yes ☐ No ☐ Do not know

29. Does your organization have a website?

☐ Yes ☐ No

30. Would you be able to apply using online platform to get an eco-label?

☐ Yes ☐ No ☐ Do not know

31. In your opinion, what do you think should be implemented as very first thing for the environmentally friendly beekeeping?

.....
.....
.....

Continued on next page →

SECTION 5. PROFILE QUESTIONS

Your personal information will be comfidential. We kindly ask you to fill in it in accurately.

32. Age	☐ 15-19	☐ 20-29	☐ 30-39	☐ 40-49
	☐ 50-59	☐ 60 and above that		
33. Gender	☐ Male	☐ Female		
34. Education	☐ Uneducated	☐ Elementary school	☐ Incomplete secondary education	☐ Completed secondary education
	☐ Bachelor	☐ Master	☐ Doctor / Phd	
35. Position	☐ Director	☐ Owner	☐ Member of family owned business	☐ Manager
	☐ Employee			
36. Years of work experience for this company	☐ Up to 1 year	☐ 1-5 years	☐ 6-10 years	☐ 11-15 years
	☐ 16-20 years	21 years and above that		
37. Number of people involved in household business / company	☐ 1-2	☐ 3-4	☐ 4-5	☐ 6 and above that
38. Size of beekeeping site/land	.....			
39. Honey output per year	*/by each product output/*			
40. Location of beekeeping site/land	*/please write full address /*			
41. Ownership of beekeeping site/land	☐ Own	☐ Lease	☐ Other	
42. How far / km/ is your site from the urban areas?	.....			

43. Would you like to participate for the FREE training and consulting services as part of "Green transition of economy" project to be implemented in Mongolia in 2022-2025 funded by the European Union's Switch Asia program?

- ☐ Yes
- ☐ No
- ☐ Maybe

Please leave your contact information for future activities of the projects to be updated.

Name of the organization (name and surname if an individual):.....

Phone number: .....

E-Mail address: .....

Thank you for you inputs to our research. Thank you so much for your valuable time.
We wish you the best.

10.4. Self-assessment questionnaire of Food and beverage production

SELF-ASSESSMENT QUESTIONNAIRE OF FOOD AND BEVERAGE PRODUCERS

Number: .....

This section should be completed by the data collector:

Date and time of data collection	Year …… month …… date ……. Started at .....:..... Finished at …..:.....
Location of the data collection	…… ……
Data collector's number	……

Hello, Dear survey respondent. We would like to extend our appreciation to you.

We are conducting the survey to determine the current situation, experience, facing challenges, training and financial needs of organization in the field of agro-food industry to cultivate, produce and to sell eco-friendly products. The results of the survey will be used to support the micro, small and medium scale producers and traders. Therefore, we kindly ask you to answer the questions accurately and completely.

1. *This questionnaire consists of 5 sections.*
2. *This questionnaire will take 15-20 minutes approximately.*
3. *Please, read each question and mark the most appropriate answer.*

Your personal and company information will remain strictly confidential in accordance with code of conduct for responsible research.

SECTION 1. GENERAL INFORMATION

1. What kind of operation does your company carry on? /you can choose multi answers/

- ☐ Food production
- ☐ Beverage production /soft drinks, water, juice etc... /
- ☐ Food production and service
- ☐ Others */ please write /*

.....

2. The ownership type of your organization?

- ☐ Domestic investment
- ☐ Foreign investment
- ☐ Mixed /joint venture/

3. What type of category does your organization belong to?

- ☐ Family-owned and individual business
- ☐ Limited liability company
- ☐ Partnership company
- ☐ Community based
- ☐ Open joint-stock company
- ☐ Closes joint company

4. How many years has your organization been running?

- ☐ Up to 1 year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ 21 years and above that

5. How many employees does your company have?

- ☐ 1-10 employees
- ☐ 11-30 employees
- ☐ 31-50 employees
- ☐ 51-200 employees
- ☐ 201 employes and above that

6. What is the average annual income of you company?

- ☐ Up to 99 million
- ☐ 100-299 million
- ☐ 300 million -1 billion
- ☐ 1-2,5 billion
- ☐ 2.5 billion and above that

7. Please rate the general situation of Mongolian production industry ***/please choose only one answer for each row/***

Please rate each one	Good	Reasonable	Bad	Very bad	Unknown
1. Product and service quality	4	3	2	1	0
2. Industry competitiveness	4	3	2	1	0
3. Producer's knowledge and skills	4	3	2	1	0
4. Government support	4	3	2	1	0
5. Regulations and standards	4	3	2	1	0
6. Technology and innovation	4	3	2	1	0
7. Cooperation and partnership	4	3	2	1	0
8. Financial resources and possibilities	4	3	2	1	0
9. Equipment supplies	4	3	2	1	0
10. Consulting services and projects for production	4	3	2	1	0
11. Information availability and access	4	3	2	1	0
12. Warehousing	4	3	2	1	0
13. Sales and distribution	4	3	2	1	0
14. Industry marketing	4	3	2	1	0
15. Human resource availability	4	3	2	1	0
16. Others */please write/*	4	3	2	1	0

Continued on next page →

SECTION 2. THE UNDERSTANDING OF THE GREEN LABEL

8. How well/much do you know about the eco label? /eco-label, organic indication and symbols/

- ☐ Very well
- ☐ Heard of it
- ☐ Never heard of it

9. How much do you agree with the following factors */please choose only one answer for each row/*

Please rate each statements	Strongly agree	Agree	Disagree	Strongly disagree	Unknown
9.6. Products should be certified with the eco-label if the norms and rules of being friendly to the environment have been followed in terms of producing process	4	3	2	1	0
9.7. The products with eco-label is a great way of giving information about environmental safety to customers	4	3	2	1	0
9.8. Having a product certified with eco-label makes business more efficient and increases the competitiveness of the company	4	3	2	1	0
9.9. Being certified with eco-label indicates the reliability of the product	4	3	2	1	0
9.10. The implementation of the eco-manufacturing processes by maintaining water and energy efficiency and recycling waste can increase the sales income which improves employee wages and living standards	4	3	2	1	0
9.7 Customers should read and pay attention to the product label	4	3	2	1	0
9.11. Customers should buy products made from recycled materials and reusable packaging	4	3	2	1	0
9.12. Customers should avoid from buying products from companies that are not responsible for the environment	4	3	2	1	0
9.13. Eco production, usage of various renewable energy, waste recycling reduce air pollution	4	3	2	1	0
9.14. Our company should be involved actively with the eco-friendly production activities	4	3	2	1	0

Continued on next page →

SECTION 3. COMPANY'S CURRENT SITUATION ASSESSMENT

10. Does your company have implemented following standards? / please choose only 1 answer for each line/

	Standards	Yes, it has been implemented	Yes, early stages of implementation	No, but it is planned	No, it is not planned	Not heard of this standards and practices
1.	MYXAYT- "Organic product/certified organic" eco label	4	3	2	1	0
2.	ХХАЛХУЯ- Organic food certificate	4	3	2	1	0
3.	Organic Mongol Program – Organic product certificate	4	3	2	1	0
4.	MNS 6737:2018 Good Agricultural Practices	4	3	2	1	0
5.	ISO 22000 Food safety management system	4	3	2	1	0
6.	ISO 14001 Environmental Management system	4	3	2	1	0
7.	Other */please write/*	4	3	2	1	0

11. Does your company follow the any of the environmental responsibility goals and projects implemented in Mongolia? /you can choose multi answers/

- ☐ Sustainable Development Goals of Mongolia
- ☐ Green Development Policy of Mongolia
- ☐ International program and projects
- ☐ Local programs and projects
- ☐ No

12. Does your company have policy documents, plans and programs aiming at developing and implementing environmental friendly practices?

- ☐ Yes, we have
- ☐ No, we dont have
- ☐ Cannot think of it

13. Does your company have efficiency related indicators to assess environmental safety and sustainability?

- ☐ Yes
- ☐ No
- ☐ Do not know

14. Does your organization practice the followings? */please chooes only one answer for each line/*

	Please rate each one	Yes	No	Unknown
1.	Our company promotes efficient water use	2	1	0
2.	Our company uses low energy consumption equipment	2	1	0
3.	Our company uses renewable energy resources	2	1	0
4.	Our company uses biodegradable materials	2	1	0
5.	We use packaging made from recycled materials	2	1	0
6.	We use reusable packaging	2	1	0
7.	We take back product packaging	2	1	0
8.	We do our repairing services internally for equipment	2	1	0
9.	We share specialized equipment and technology with other organizations	2	1	0
10.	We use vehicles that use less fuel and electricity	2	1	0

Continued on next page →

	Please rate each one	Yes	No	Unknown
11.	We have posted signs, guidelines and notice boards to promote the efficient use	2	1	0
12.	Our company has created waste management system to collect, sort and recycle	2	1	0
13.	We have training on waste management system	2	1	0
14.	Our organization uses flavorings and artificial preservatives at acceptable level for our products	2	1	0
15.	Our company usually checks on the origin of the ingredients, certification and transportation condition before the production	2	1	0
16.	Our company keeps the records of the storage and transportation and uses customized vehicles to carry out the products properly	2	1	0
17.	Operating cost of our company has decreased and income increased by running business in economical way with eco-friendly manner	2	1	0
18.	It has become easier to get loans by adopting the environmental friendly practices	2	1	0
19.	Our company has met the requirements to get tax benefits by adopting the environmental friendly practices	2	1	0
20.	Our company's public relations have improved adopting the environmental friendly practices	2	1	0

15. Do your company's procurement procedures use the following criteria to suppliers when purchasing? /please choose only one answer for each statement/

	Please rate each one	Yes	No	Unknown
1.	Reusable products and materials	2	1	0
2.	Products with possibilities of recyclability and disassembly	2	1	0
3.	Bulk products or products with reduced amount of packaging	2	1	0
4.	Products with a takeback system of related waste and packaging	2	1	0
5.	Equipment and technology with highest energy efficiency	2	1	0
6.	Product and equipment requiring the provision of clean and renewable energy sources	2	1	0
7.	Products with obligation to repair with no additional cost	2	1	0
8.	Products and raw materials with certificate of good quality from laboratory	2	1	0
9.	Products with eco-label and organic products certificate	2	1	0

16. How do you manage waste generated during the production process? */you can choose multi answers/*

- ☐ Makes compost for fertility
- ☐ It is destroyed by burning
- ☐ Used for land filling
- ☐ Used as feed for animals
- ☐ Will be sold
- ☐ Throw away without processing
- ☐ Do not know

17. What kind of materials does your company use for product packaging? */you can choose multi answers/*

- ☐ Glass
- ☐ Recycled paper materials
- ☐ Recycled plastic
- ☐ Cloth bag
- ☐ Plastic bag
- ☐ Other */please write/*.....

18. How does your organization save energy? */you can choose multi answers/*

- ☐ Use of solar energy
- ☐ Use of wind energy
- ☐ Nighttime energy consumption at discounted rate

Continued on next page →

19. How does your organization save water? */you can choose multi answers/*

- ☐ Monitoring the water efficient practices
- ☐ Uses water on surfaces
- ☐ Uses rain water
- ☐ Uses grey water

20. Where does your organization buy raw materials and supplies from? ***/you can choose multi answers/***

- ☐ We supply ourselves
- ☐ We import from abroad
- ☐ From importing companies
- ☐ From the domestic producers
- ☐ From wholesalers and retailers

21. What kind of ingredients does your company use for production?

- ☐ Natural organic fruits, vegetables and herbs
- ☐ Artificial ingredients such as syrup, powder and substitutes

22. Where does your company sell your products? ***/you can choose multi answers/***

- ☐ Sells to local market
- ☐ Sold in Ulaanbaatar city
- ☐ We export

23. Who does your company sell your products to? ***/you can choose multi answers/***

- ☐ To retailers
- ☐ To wholesalers
- ☐ To commercial food service companies
- ☐ To processing companies
- ☐ To dealers
- ☐ To customers
- ☐ To partnership and community groups

24. What are the difficulties and challenges in implementing environmental concerned production in your organization? ***/you can choose multi answers/***

- ☐ The support from the upper management level
- ☐ Lack of knowledge, skills and experience of management team and employees
- ☐ Lack of financial resources
- ☐ Number of suppliers is limited
- ☐ Short term and unstable political change
- ☐ Operating cost is high
- ☐ There is no supplier in Mongolia
- ☐ Lack of information
- ☐ Don't know what to do and where to start
- ☐ Other */please write/* .....

25. How is the use of digital platform and technologies in your operation? */please choose only one answer for each line/*

Please rate each one	Very well used	Started to use	Planning to use	Not planned to use	Do not know about it
1. Digital technology used daily in operations. /e-mail, intranet, software.../	4	3	2	1	0
2. Digital technology used to save time and expenses /digital platform service, e-taxing report and remote monitoring…/	4	3	2	1	0
3. Digitalize documents and digital archiving used	4	3	2	1	0
4. Digital platform to organize meetings online /google meet, skype, zoom.../	4	3	2	1	0
5. Support from company to work from home for employees	4	3	2	1	0

Continued on next page →

26. Please rate your company's readiness to develop eco-freindly and environmentally safe production with following capabilities. */please choose only one answer for each factors/*

Please rate each one		Fully capable of developing	Needs to be improved	Poor capability	Not ready at all	Do not know
1.	Tangible assets /Building, facility, property/	4	3	2	1	0
2.	Technology, know-how, equipment	4	3	2	1	0
3.	Financial capability	4	3	2	1	0
4.	Land	4	3	2	1	0
5.	Patent	4	3	2	1	0
6.	Organizational culture to encourage eco practices	4	3	2	1	0
7.	Company's prestige, image and recognition	4	3	2	1	0
8.	Enough number of employees and well trained human resources	4	3	2	1	0
9.	Organizational management, strategy and objectives	4	3	2	1	0
10.	Well participation in regular training	4	3	2	1	0
11.	Adoption of information technology	4	3	2	1	0
12.	Capable of doing research and its analysis	4	3	2	1	0
13.	Partnership and cooperation	4	3	2	1	0
14.	Other */please write/*.....	4	3	2	1	0

Continued on next page →

SECTION 4. TRAINING AND FINANCIAL NEEDS

27. Does your company need training and consulting services to develop the 'environmentally friendly production? */please choose only one answer for each statement/*

	Please rate each one	Yes	No	Do not know
1.	Eco-friendly production, adoption of standarts and getting certificated	2	1	0
2.	Use of renewable energy	2	1	0
3.	Energy efficient technology	2	1	0
4.	Reducing soil pollution and improving air quality	2	1	0
5.	Technology to reduce water consumption and reuse of greywater and rainwater	2	1	0
6.	Waste management to collect, sort and recycle	2	1	0
7.	Know-how and new technology	2	1	0
8.	Sales and marketing	2	1	0
9.	Agricultural extension services	2	1	0
10.	Human resource management	2	1	0
11.	Financial management	2	1	0
12.	Other */please write...../*	2	1	0

28. What type of additional financial resources does your company need to develop the 'environmentally friendly production? */please choose only one answer for each statement/*

- ☐ Bank loan
- ☐ Project loan
- ☐ Government discounted loan
- ☐ Non-bank financial organization's loan
- ☐ Grants from international organization
- ☐ Share offering at market
- ☐ Not necessary at the moment
- ☐ Other .....

29. Please specify the amount of loan / financing required. ..... tugrug.

30. Do you have a feasibility study of environmental friendly food producing project that needs financing?

☐ Yes ☐ No

31. What are the challenges facing in obtaining finance? */you can choose multi answer/*

- ☐ To write project
- ☐ Loan collateral
- ☐ Loan guarantor
- ☐ Loan interest rate and term
- ☐ Loan availablitity

32. Would your organization participate in the mentorship program which designed to your needs to help you to develop the environmentally friendly production?

☐ Yes ☐ No ☐ Do not know

33. Does your organization have a website?

☐ Yes ☐ No

34. Would you be able to apply using online platform to get an eco-label?

☐ Yes ☐ No ☐ Do not know

35. In your opinion, what do you think should be implemented as very first thing for the environmentally friendly production?

.....
.....
.....

Continued on next page →

SECTION 5. PROFILE QUESTIONS

Your personal information will be comfidential. We kindly ask you to fill in it in accurately.

36. Age	☐ 15-19	☐ 20-29	☐ 30-39	☐ 40-49
	☐ 50-59	☐ 60 and above that		
37. Gender	☐ Male	☐ Female		
38. Education	☐ Uneducated	☐ Elementary school	☐ Incomplete secondary education	☐ Completed secondary education
	☐ Bachelor	☐ Master	☐ Doctor / Phd	
39. Position	☐ Director	☐ Owner	☐ Member of family owned business	☐ Manager
	☐ Employee			
40. Years of work experience for this company	☐ Up to 1 year	☐ 1-5 years	☐ 6-10 years	☐ 11-15 years
	☐ 16-20 years	21 years and above that		
41. Number of people involved in household business / company	☐ 1-2	☐ 3-4	☐ 4-5	☐ 6 and above that
42. Size of production site/land	.....			
43. Production output	*/by each product output/*			
44. Location of production site/land	*/please write full address /*			
45. Ownership of production site/land	☐ Own	☐ Lease	☐ Other	
46. How far /km/ is your site from the urban areas?	.....			

47. Would you like to participate for the FREE training and consulting services as part of "Green transition of economy" project to be implemented in Mongolia in 2022-2025 funded by the European Union's Switch Asia program?

- ☐ Yes
- ☐ No
- ☐ Maybe

Please leave your contact information for future activities of the projects to be updated.

Name of the organization (name and surname if an individual):.....

Phone number: .....

E-Mail address: .....

Thank you for you inputs to our research. Thank you so much for your valuable time.
We wish you the best.

10.5. Self-assessment questionnaire of Retailers

SELF-ASSESSMENT QUESTIONNAIRE OF SALES AND SERVICE PROVIDERS

Number: .....

This section should be completed by the data collector:

Date and time of data collection	Year …… month …… date ……. Started at .....:..... Finished at …..:.....
Location of the data collection	…… ……
Data collector's number	……

Hello, Dear survey respondent. We would like to extend our appreciation to you.

We are conducting the survey to determine the current situation, experience, facing challenges, training and financial needs of organization in the field of agro-food industry to cultivate, produce and to sell eco-friendly products. The results of the survey will be used to support the micro, small and medium scale producers and traders. Therefore, we kindly ask you to answer the questions accurately and completely.

1. *This questionnaire consists of 5 sections.*
2. *This questionnaire will take 15-20 minutes approximately.*
3. *Please, read each question and mark the most appropriate answer.*

Your personal and company information will remain strictly confidential in accordance with code of conduct for responsible research

НЭГДҮГЭЭР ХЭСЭГ. ЕРӨНХИЙ МЭДЭЭЛЭЛ

1. What kind of operation does your company carry on? /you can choose multi answers/

- ☐ Agriculture
- ☐ Beekeeping
- ☐ Production
- ☐ Retailer
- ☐ Food production and services
- ☐ Warehousing
- ☐ Logistics
- ☐ Others */ please write /* .....

2. The ownership type of your organization?

- ☐ Domestic investment
- ☐ Foreign investment
- ☐ Mixed /joint venture/

3. What type of category does your organization belong to?

- ☐ Family-owned and individual business
- ☐ Limited liability company
- ☐ Partnership company
- ☐ Community based
- ☐ Open joint-stock company
- ☐ Closes joint company

4. How many years has your organization been running?

- ☐ Up to 1 year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ 21 years and above that

5. How many employees does your company have?

- ☐ 1-10 employees
- ☐ 11-30 employees
- ☐ 31-50 employees
- ☐ 51-200 employees
- ☐ 201 employes and above that

6. What is the average annual income of you company?

- ☐ Up to 99 million
- ☐ 100-299 million
- ☐ 300 million -1 billion
- ☐ 1-2,5 billion
- ☐ 2.5 billion and above that

7. Please rate the general situation of Mongolian production industry ***/please choose only one answer for each row/***

Please rate each one	Good	Reasonable	Bad	Very bad	Unknown
7.1 Product and service quality	4	3	2	1	0
7.2 Industry competitiveness	4	3	2	1	0
7.3 Producer's knowledge and skills	4	3	2	1	0
7.4 Government support	4	3	2	1	0
7.5 Regulations and standards	4	3	2	1	0
7.6 Technology and innovation	4	3	2	1	0
7.7 Cooperation and partnership	4	3	2	1	0
7.8 Financial resources and possibilities	4	3	2	1	0
7.9 Equipment supplies	4	3	2	1	0
7.10 Consulting services and projects for production	4	3	2	1	0
7.11 Information availability and access	4	3	2	1	0
7.12 Warehousing	4	3	2	1	0
7.13 Sales and distribution	4	3	2	1	0
7.14 Industry marketing	4	3	2	1	0
7.15 Human resource availability	4	3	2	1	0
7.16 Others */please write/*	4	3	2	1	0

Continued on next page →

SECTION 2. UNDERSTANDING OF THE ECO-LABEL

8 How well/much do you know about the eco label? /eco-label, organic indication and symbols/

- ☐ Very well
- ☐ Heard of it
- ☐ Never heard of it

***9* How much do you agree with the following factors** */please choose only one answer for each row/*

Please rate each statements	Strongly agree	Agree	Disagree	Strongly disagree	Unknown
9.1. Products should be certified with the eco-label if the norms and rules of being friendly to the environment have been followed in terms of producing process	4	3	2	1	0
9.2. The products with eco-label is a great way of giving information about environmental safety to customers	4	3	2	1	0
9.3. Having a product certified with eco-label makes business more efficient and increases the competitiveness of the company	4	3	2	1	0
9.4. Being certified with eco-label indicates the reliability of the product	4	3	2	1	0
9.5. The implementation of the eco-manufacturing processes by maintaining water and energy efficiency and recycling waste can increase the sales income which improves employee wages and living standards	4	3	2	1	0
9.6 Customers should read and pay attention to the product label	4	3	2	1	0
9.7. Customers should buy products made from recycled materials and reusable packaging	4	3	2	1	0
9.8. Customers should avoid from buying products from companies that are not responsible for the environment	4	3	2	1	0
9.9. Eco production, usage of various renewable energy, waste recycling reduce air pollution	4	3	2	1	0
9.10. Our company should be involved actively with the eco-friendly production activities	4	3	2	1	0

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SECTION 3. COMPANY'S CURRENT SITUATION ASSESSMENT

10 **Does your company have implemented following standards? / please choose only 1 answer for each line/**

Standards	Yes, it has been implemented	Yes, early stages of implementation	No, but it is planned	No, it is not planned	Not heard of this standards and practices
10.1 MYXAYT- "Organic product/certified organic" eco label	4	3	2	1	0
10.2 ХХАЛХУЯ- Organic food certificate	4	3	2	1	0
10.3 Organic Mongol Program – Organic product certificate	4	3	2	1	0
10.4 MNS 6737:2018 Good Agricultural Practices	4	3	2	1	0
10.5 ISO 22000 Food safety management system	4	3	2	1	0
10.6 ISO 14001 Environmental Management system	4	3	2	1	0
10.7 Other */please write/*	4	3	2	1	0

11 Does your company follow the any of the environmental responsibility goals and projects implemented in Mongolia? /you can choose multi answers/

- ☐ Sustainable Development Goals of Mongolia
- ☐ Green Development Policy of Mongolia
- ☐ International program and projects
- ☐ Local programs and projects
- ☐ No

12 Does your company have policy documents, plans and programs aiming at developing and implementing environmental friendly agricultural practices?

- ☐ Yes, we have
- ☐ No, we dont have
- ☐ Cannot think of it

13 Does your company have efficiency related indicators to assess environmental safety and sustainability?

- ☐ Yes
- ☐ No
- ☐ Do not know

14. Does your organization practice the followings? ***/please choose only one answer for each line/***

Please rate each one	Yes	No	Unknown
14.1. Our company promotes efficient water use	2	1	0
14.2. We use rainwater and greywater in everyday operation	2	1	0
14.3. We use energy efficient equipment	2	1	0
14.4. We use low-emission generated and electric vehicles	2	1	0
14.5. Our truck and delivery drivers are skilled with to make fuel efficient	2	1	0
14.6. Our equipment is cleaned regularly	2	1	0

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Please rate each one	Yes	No	Unknown
14.7. Our equipment is maintained regularly	2	1	0
14.8. We use packaging made from recycled materials	2	1	0
14.9. We use reusable packaging	2	1	0
14.10. We take back product packaging	2	1	0
14.11. The walls, floor and ceilings of the warehouse are non-flammable and durable	2	1	0
14.12. Our warehouse has energy efficient lighting and an automatic and cooling system meets international standards	2	1	0
14.13. Service area is equipped with a furniture made from recycled materials	2	1	0
14.14. Green plants and trees are used to create the service capes	2	1	0
14.15. Employees are provided with uniforms made from recycled materials	2	1	0
14.16. We have an optimal control system and regulations for sales, service, produce and storage in operation	2	1	0
14.17. We have training on waste management system to collect, sort and recycle	2	1	0

15. **Does your organization cooperate with other sales and service providers?** */please choose only one answer for each line*

Please rate each one	Yes	No	Unknown
15.1. food producers	2	1	0
15.2. retailers	2	1	0
15.3. equipment suppliers	2	1	0
15.4. Warehousing	2	1	0
15.5. Logistics	2	1	0
15.6. Training and consulting	2	1	0
15.7. Sales and marketing	2	1	0
15.8. Financing	2	1	0
15.9. Other ……..			

16. **Who does your company sell/provide your products/service to?** ***/you can choose multi answers/***

- ☐ To end-users
- ☐ To corporate users
- ☐ To government organization
- ☐ Others ……..

17. What do you use for keeping and storing honey? */you can choose multi answers/*

- ☐ Contract warehouse
- ☐ Fridge and freezer
- ☐ Refrigerated vehicles
- ☐ Other */please write/*.....

18. **What are the difficulties and challenges in implementing environmental concerned sales and service providing in your organization?** ***/you can choose multi answers/***

- ☐ The support from the upper management level
- ☐ Lack of knowledge, skills and experience of management team and employees
- ☐ Lack of financial resources
- ☐ Number of suppliers is limited
- ☐ Short term and unstable political change
- ☐ Investment possibilities are rare
- ☐ Operating cost is high
- ☐ There is no supplier in Mongolia
- ☐ Lack of information
- ☐ Don't know what to do and where to start
- ☐ Other */please write/* .....

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19. **How is the use of digital platform and technologies in your operation?** */please choose only one answer for each line/*

Please rate each one	Very well used	Started to use	Planning to use	Not planned to use	Do not know about it
19.1. Digital technology used daily in operations. /e-mail, intranet, software.../	4	3	2	1	0
19.2. Digital technology used to save time and expenses /digital platform service, e-taxing report and remote monitoring…/	4	3	2	1	0
19.3. Digitalize documents and digital archiving used	4	3	2	1	0
19.4. Digital platform to organize meetings online /google meet, skype, zoom.../	4	3	2	1	0
19.5. Support from company to work from home for employees	4	3	2	1	0

20. **Please rate your company's readiness to develop eco-freindly and environmentally safe sales and service providers with following capabilities.** */please choose only one answer for each factors/*

Please rate each one	Fully capable of developing	Needs to be improved	Poor capability	Not ready at all	Do not know
20.1 Tangible assets /Building, facility, property/	4	3	2	1	0
20.2 Technology, know-how, equipment	4	3	2	1	0
20.3 Financial capability	4	3	2	1	0
20.4 Land	4	3	2	1	0
20.5 Patent	4	3	2	1	0
20.6 Organizational culture to encourage eco practices	4	3	2	1	0
20.7 Company's prestige, image and recognition	4	3	2	1	0
20.8 Enough number of employees and well trained human resources	4	3	2	1	0
20.9 Organizational management, strategy and objectives	4	3	2	1	0
20.10 Well participation in regular training	4	3	2	1	0
20.11 Adoption of information technology	4	3	2	1	0
20.12 Capable of doing research and its analysis	4	3	2	1	0
20.13 Partnership and cooperation	4	3	2	1	0
22.14. Other */please write/*.....	4	3	2	1	0

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SECTION 4. TRAINING AND FINANCIAL NEEDS

21. Does your company need training and consulting services to develop the 'environmentally friendly production? */please choose only one answer for each statement/*

Please rate each one	Yes	No	Do not know
21.1 Eco-friendly sales and service providers, adoption of standard and getting certificated	2	1	0
21.2 Use of renewable energy	2	1	0
21.3 Energy efficient technology	2	1	0
21.4 Reducing soil pollution and improving air quality	2	1	0
21.5 Technology to reduce water consumption and reuse of greywater and rainwater	2	1	0
21.6 Waste management to collect, sort and recycle	2	1	0
21.7 Know-how and new technology	2	1	0
21.8 Sales and marketing	2	1	0
21.9 Agricultural extension services	2	1	0
21.10 Human resource management	2	1	0
21.11 Financial management	2	1	0
21.12 Other */please write...../*	2	1	0

22. What type of additional financial resources does your company need to develop the 'environmentally friendly beekeeping? */please choose only one answer for each statement/*

- ☐ Bank loan
- ☐ Project loan
- ☐ Government discounted loan
- ☐ Non-bank financial organization's loan
- ☐ Grants from international organization
- ☐ Share offering at market
- ☐ Not necessary at the moment
- ☐ Other .....

23. Please specify the amount of loan / financing required. ..... tugrug.

24. Do you have a feasibility study of environmental friendly sales and service providing project that needs financing?

☐ Yes ☐ No

***25.* What are the challenges facing in obtaining finance?** */you can choose multi answer/*

- ☐ To write project
- ☐ Loan collateral
- ☐ Loan guarantor
- ☐ Loan interest rate and term
- ☐ Loan availablitity

26. Would your organization participate in the mentorship program which designed to your needs to help you to develop the environmentally friendly sales and service providing services?

☐ Yes ☐ No ☐ Do not know

27. Does your organization have a website?

☐ Yes ☐ No

28. Would you be able to apply using online platform to get an eco-label?

☐ Yes ☐ No ☐ Do not know

29. **In your opinion, what do you think should be implemented as very first thing for the environmentally friendly sales and service providers?**

.....
.....
.....

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SECTION 5. PROFILE QUESTIONS

Your personal information will be comfidential. We kindly ask you to fill in it in accurately.

30. Age	☐ 15-19	☐ 20-29	☐ 30-39	☐ 40-49
	☐ 50-59	☐ 60 and above that		
31. Gender	☐ Male	☐ Female		
32. Education	☐ Uneducated	☐ Elementary school	☐ Incomplete secondary education	☐ Completed secondary education
	☐ Bachelor	☐ Master	☐ Doctor / Phd	
33. Position	☐ Director	☐ Owner	☐ Member of family owned business	☐ Manager
	☐ Employee			
34. Years of work experience for this company	☐ Up to 1 year	☐ 1-5 years	☐ 6-10 years	☐ 11-15 years
	☐ 16-20 years	21 years and above that		
35. Number of people involved in household business / company	☐ 1-2	☐ 3-4	☐ 4-5	☐ 6 and above that
36. Size of sales and service providers site/land	.....			
37. Location of sales and service site/land	*/please write full address /*			
38. Ownership of sales and service providers site/land	☐ Own	☐ Lease	☐ Other	
39. How far / km/ is your site from the urban areas?	.....			

40. Would you like to participate for the FREE training and consulting services as part of "Green transition of economy" project to be implemented in Mongolia in 2022-2025 funded by the European Union's Switch Asia program?

- ☐ Yes
- ☐ No
- ☐ Maybe

Please leave your contact information for future activities of the projects to be updated.

Name of the organization (name and surname if an individual):.....

Phone number: .....

E-Mail address: .....

Thank you for you inputs to our research. Thank you so much for your valuable time.
We wish you the best.