switchasia GRANTS PROGRAMME

Funded by the European Union

SUSTAINABLE PLASTIC RECYCLING IN MONGOLIA

MARKET RESEARCH ON RECYCLED PLASTIC PRODUCTS IN MONGOLIA

STUDY REPORT

Ulaanbaatar
August 2022

MIRIM
INNOVATION & CONSULTANT

MIRIM Consultant LLC developed the report with commission of the Caritas Czech Republic under the Sustainable Plastic Recycling in Mongolia project funded by the European Union's Switch-Asia program. The opinions and conclusions presented in the report do not necessarily reflect the views of the European Union.

CONTENT

ACKNOWLEDGEMENT

Commissioned with the Caritas Czech Republic in Mongolia, the study team of MIRIM Consultant LLC delivered consulting services on Market Research on Recycled Plastic Products in Mongolia from June 8, 2022, to September 16, 2022.

The purpose of the study was to assess the opportunities in the domestic market for recycled plastic products through identifying relevant supply and demand potentials for recycled plastic products.

A team of consultants and researchers with high professional skills worked together on the study design, methodologies, data collection, analysis, and report development.

The study team would like to thank the project manager Mijidsuren.Ch, the project coordinator Sanchirgarav.B, and the consultant Enkhdol.T for their cooperation on the project. In addition, we would like to extend our gratitude to the organizations, experts, and researchers that participated in the data collection as well as enumerators and respondents for their contribution to the completion of the project.

We hope that the study findings and results will fully meet the demands of interested stakeholders.

Study Team

ABBREVIATION

EU	European Union
FIE	Foreign Invested Enterprise
GoM	Government of Mongolia
MCGA	Mongolian Customs General Administration
MLW	Mongolian Law on Waste
MNRA	Mongolian National Recycling Association
MoF	Ministry of Finance
MSME	Micro, Small and Medium-Sized Enterprises
NGO	Non-government Organization
NSO	National Statistics Office
OECD	Organization for Economic Co-operation and Development
PRC	People's Republic of China
SDG	Sustainable Development Goals
SPRIM	Sustainable Plastic Recycling in Mongolia
VAT	Value-added Tax

LIST OF FIGURES

LIST OF TABLES

STUDY TEAM

The Study Team of MIRIM consultant executed the consulting. The study conclusion presented in the report reflects only the study team's opinions backed up by the study findings and results.

The team members are as follows.

CORE TEAM

TEAM LEADER	**BAYASGALAN.B** /PhD in Public Administration, Associate Professor/
TEAM MEMBER	**MUNKHTSETSEG.D** /MA in Economics/
TEAM MEMBER	**BATJARGAL.D** /BA in Hydro Engineering/
TEAM MEMBER	**YANJINPAGMA.N** /MA in Sociology/
TEAM MEMBER	**MUNKHBAT.L** /MA in Sociology/
TEAM MEMBEr	**BAASANKHUU.B** /International Relations, BA in English Translation/

01 STUDY METHODS AND METHODOLOGIES

1.1 | BACKGROUND

With the population growth of Mongolia, economic expansion and advent of the new industries and services, the needs of people change and so do the amount of waste and types of waste year by year. As of 2021, the total amount of waste in Ulaanbaatar city was 1.4 million tons, and the total amount of recycled raw materials was 124,028 tons per year. 8.9% of the total waste was recycled (Batjargal D, 2021).

Mongolia produces 2.2 million tons of secondary raw materials, of which 1.4 million tons are produced in Ulaanbaatar. 3-5% of the total waste is recycled in Mongolia, but 8.9% is recycled in Ulaanbaatar. As of 2021, there are 40 waste recycling plants, more than 160 separate processing points, and more than 1,500 staff. The statistical classification of the recycling industry is divided into the industries of petroleum and plastic products to produce aggregate numerical data. As of 2020, the production volume of the industry reached to MNT 14.1 billion, and the sales volume was MNT 15.5 billion MNT, which was halved from the previous year's (Ministry of Food, Agriculture and Light Industry, 2022).

Even though 50% of the total waste could be recycled, only 8% of it is being recycled and exported. However, 6% of sorted plastic waste is recycled (Environmental Information Center, 2017).

The Government of Mongolia (GoM) is implementing a policy to keep recyclable waste in economic circulation, save natural resources and reduce the amount of waste. GoM strives to do this by creating a comprehensive waste management including recycling and reusing waste and producing various resources from it. One major work done was the adoption of the revision of the Mongolian Law on Waste (MLW) in 2017, in line with the Sustainable Development Goals (SDGs) and international standards.

From December 31, 2017, the People's Republic of China (PRC) made a statement to control importation of recyclable waste to reduce environmental pollution, eliminate adverse effects, and protect public health. With the statement, a total of 24 types of waste, including 8 types of plastic waste, one type of unsorted paper waste, 11 types of textile material waste, and 4 types of iron waste are prohibited for import. It does not ban the import of waste PET plastic bottles, but places a limit on the amount.

Due to this decision of China, many countries, including Mongolia, are facing a significant challenge on how to dispose of plastic product waste. Specifically, we are faced with the choice of burying our plastic waste or recycling it.

Thus, recycling plastic waste domestically according to international standards and putting plastic waste into economic circulation is the optimal solution. The consultancy was based on the need of Recycled Plastic Products Market Research in Mongolia to determine the market opportunities for recycled plastic products to encourage the competitiveness of MSMEs engaged in plastic recycling in Mongolia and to increase the number of users.

[1] Mongolian National Recycling Association, Research report. 2021.

[2] Plastic bottles take up to 450 years to decompose in landfill.

1.2 | STUDY OBJECTIVES

The purpose of the research is to analyze the market demand and supply of Mongolia's recycled plastic products, competition, constraints to the market growth, market size, capacity, opportunities and risks, and develop recommendations for the MSMEs in the areas of product development and introduction of new products.

The following objectives are set under the above-mentioned purpose:

1 **Conduct a study of the supply of recycled plastic products**

The capacity, resources, market share, competition and product value chain of recycled plastic products producers are studied in detail.

2 **Conduct a demand study for recycled plastic products**

The capacity, size and growth rate of the market for recycled plastic products are evaluated while future demand and buyer behavior are determined.

3 **Conduct the situational analysis**

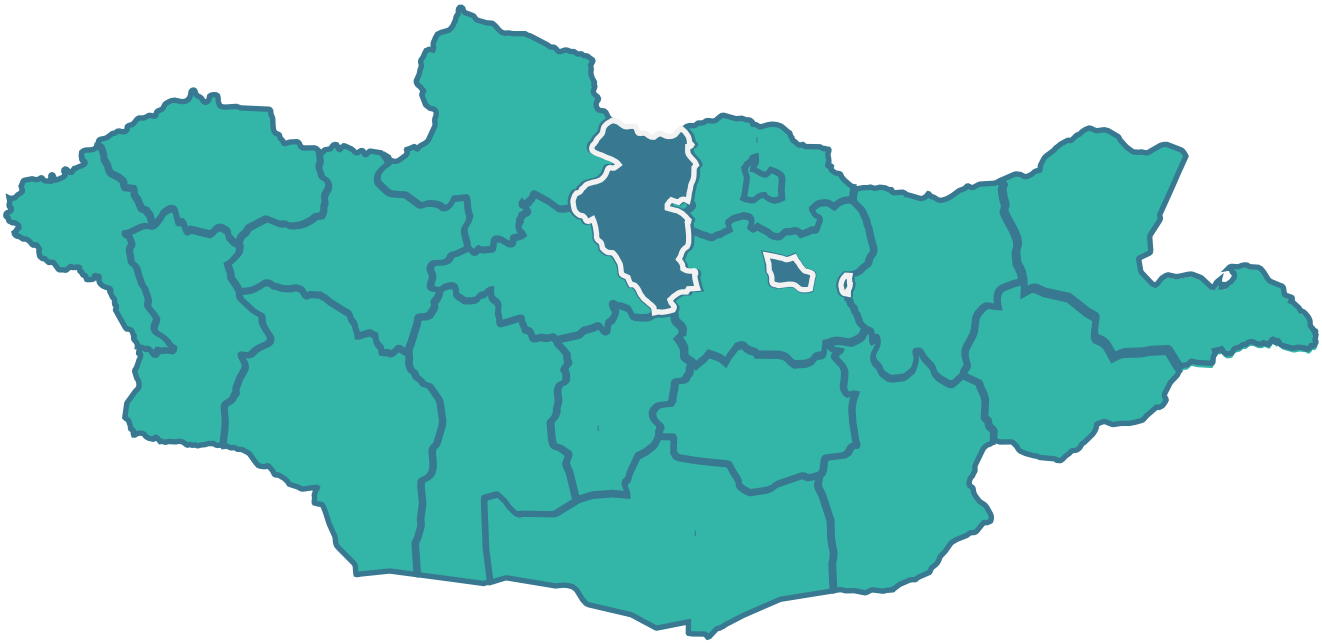
Export and import volumes will be calculated based on the existing legal and policy environment, ongoing programs, and international practice. Quality and prices will be compared for the main products

4 **Develop recommendations**

Sales opportunities will be identified and new products recommendations will be developed based the types of products, their market opportunities, and limitations for improving the existing products.

1.3 | SCOPE OF THE STUDY AND SAMPLING

The survey covered nine districts of Ulaanbaatar and Bulgan aimag. The data collection was conducted between June 25 and July 8, 2022.



SAMPLE SIZE

The target group of the study included plastic recycling MSMEs, producers and importers of similar plastic products, users of plastic products, relevant government agencies, professional associations, and other stakeholders. The survey covered a total of 445 respondents. The table below shows the detailed sample.

№	Stakeholders	Location		Total score
		UB	Bulgan aimag	
1	Survey on recycled plastic product users- –End users	335	50	385
2	Survey on recycled plastic product users- Entity users	20	-	20
3	Survey on MSMEs producing recycled plastic products	19	-	19
4	Survey on importers and distributors of plastic products	18	-	18
5	In-depth interviews with th relevant government organizations	2	-	2
6	Representatives from professional association, project and programs, and consultants	1	-	1
	Total			**445**

Table 1. *Sample size*

385 households, or end users were randomly selected for the quantitative survey. According to the NSO's report, as of 2021, 431,596 "MSMEs" households were registered in Bulgan province and Ulaanbaatar city . With a confidence level of 95 percent and an error margin of ±5, the sample size is 385.

A total of 60 in-depth interviews were conducted with managers and experts from the relevant ministries, agencies, professional associations, MSMEs, suppliers of raw materials, importers of similar products. The final list of the stakeholders was finalized in consultation with the client, and the interviews were conducted both virtually and in person. 2015-2019 data of the Mongolian Customs General Administration (MCGA) and other statistics from the professional associations and relevant government institutions were used as secondary data.

[2] NSO, Database, Хүн ам (1212.mn)

2.1 | STUDY ON THE GLOBAL SITUATIONS OF PLASTIC PRODUCT PRODUCTION, RECYCLING AND USE OF PLASTIC WASTE

Plastics are one of the world's greatest industrial innovations, but the growth of production and the improper disposal of plastic waste are imposing adverse effects on human health and the environment, including climate change, marine pollution, biodiversity loss and chemical pollution.

Plastic consumption has quadrupled over the past 30 years, driven by growth in emerging markets. Global plastic production and consumption doubled between 2000 and 2019, reaching 460 million tons . Since 2011, as the world's total consumption of plastic products has continuously increased (Figure 1), the use of recycled and secondary raw materials in the use of plastic products has increased (Figure 2). In 2011, the world produced 363 million tons of plastic products, of which 95.6% were produced using primary raw materials and 4.4% were produced using recycled plastic. 8 years later, in 2019, 460 million tons of plastic products were produced, which is 26.6% more than in 2011. 6.3% of this was produced from recycled and secondary raw materials, indicating an increase in the use of recycled raw materials in the production of plastic products compared to 2011.

Figure 1. *Global consumption of plastic products, by tons*

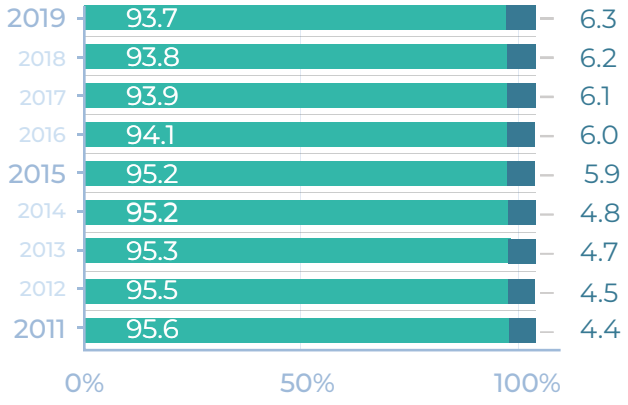
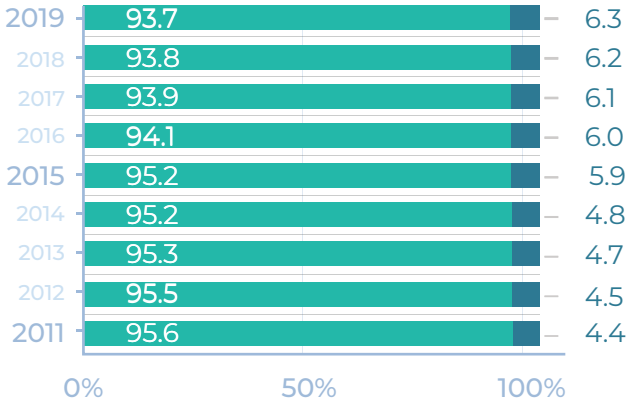


Figure 2. *Raw material input in total global plastic product consumption, by tons*



Source of the data: OECD database ***stats.oecd.org***

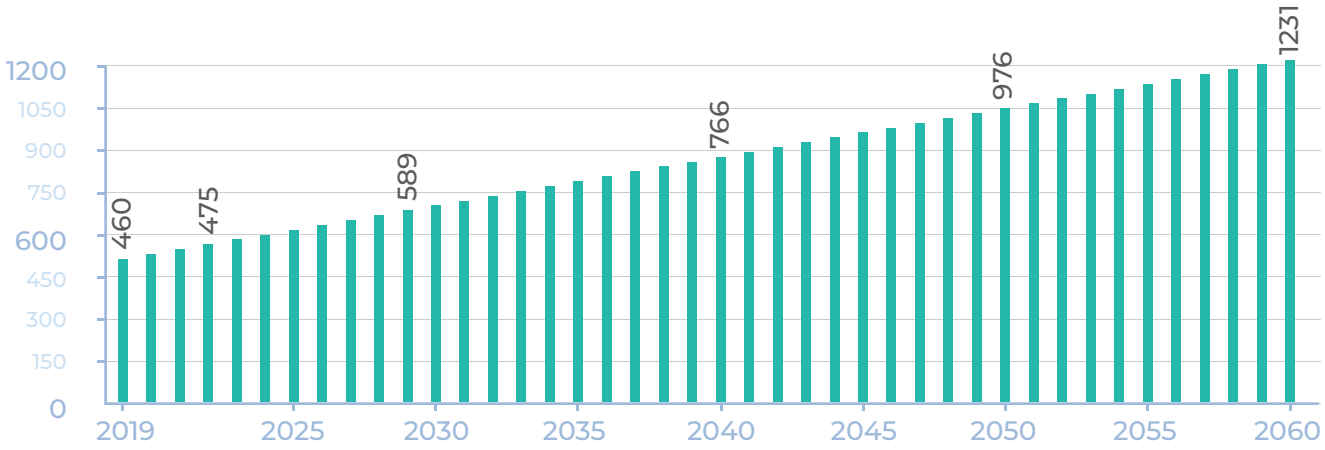
According to the forecasts made by the OECD, the global plastic production and consumption will continue to grow by an average of 2.58% per year, and compared to the current level of 2022, plastic use will be 1.6 times higher in 2040, 2.1 times higher in 2050, and 2.6 times higher in 2060 respectively (Figure 3). Plastics are adapted to many industries such as packaging, packaging, construction, automobile manufacturing, furniture, toys, footwear, household appliances, electrical and electronic goods manufacturing, and agricultural manufacturing. This situation is the reason for the rapid increase in the production and consumption of plastic products worldwide.

As the production and consumption of plastic products increase, so does the amount of plastic waste. Between 2000 and 2019, the amount of plastic waste in the world doubled to 353 million tons. Almost two-thirds of plastic waste comes from plastics with a lifespan of less than five years, 40% from packaging, 12% from user goods, and 11% from clothing and textiles. Only 9% of plastic waste is recycled. This is despite 15% of plastic waste being collected for recycling, 40% of it ends up as waste during processing. 19% of plastic waste

[3] Organization for Economic Cooperation and Development, 2022

is incinerated, 50% is disposed of in landfills, and the remaining 22% escapes waste management systems and is disposed of in uncontrolled landfills, incinerated in open pits, or disposed of in terrestrial or aquatic environments .

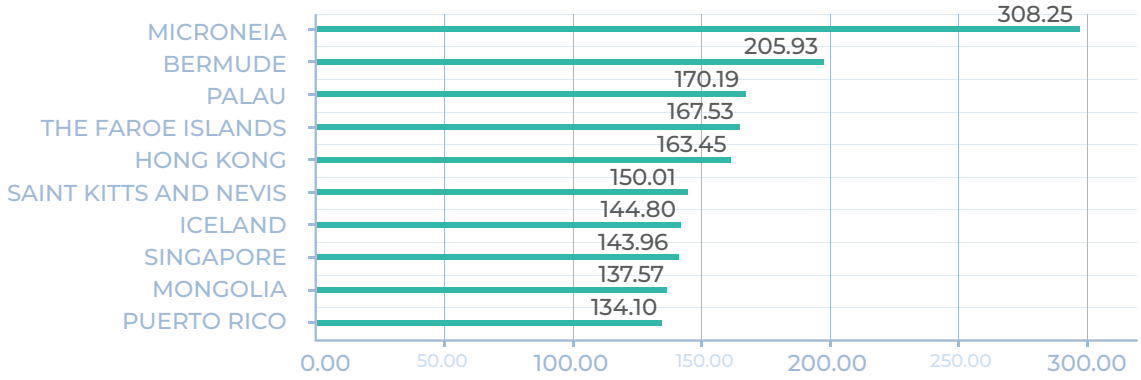
Figure 3. *Forecast of global production of plastic products, by million tons*



Source of the data: *World Population Review, Plastic Pollution by Country 2022* ***worldpopulationreview.com***

As of 2016, the United States, India, China, Brazil, Indonesia, Russia, Germany, the United Kingdom, Mexico, and Japan generated the largest amount of plastic waste. But for these countries, the amount of waste per person is not much compared to other countries . The Global Waste Report shows the countries that produce the most plastic waste per capita, and the amount of waste per capita expressed in kilograms is shown in Figure 4. Micronesia, Bermuda and Palau lead the list, while Mongolia is ranked 9th. This list demonstrates that Mongolia needs to take significant measures to reduce the use of plastic products, recycle plastic waste, and create a green economic structure (World Population Review, 2022).

Figure 4. *Top 10 countries that produce the most plastic waste per year, by kilogram, 2016*



Source of the data: *World Population Review, Plastic Pollution by Country* ***worldpopulationreview.com***

[4] (Organization for Economic Cooperation and Development, 22 Feb 2022)
[5] (Plastic Pollution by Country 2022, 2022)

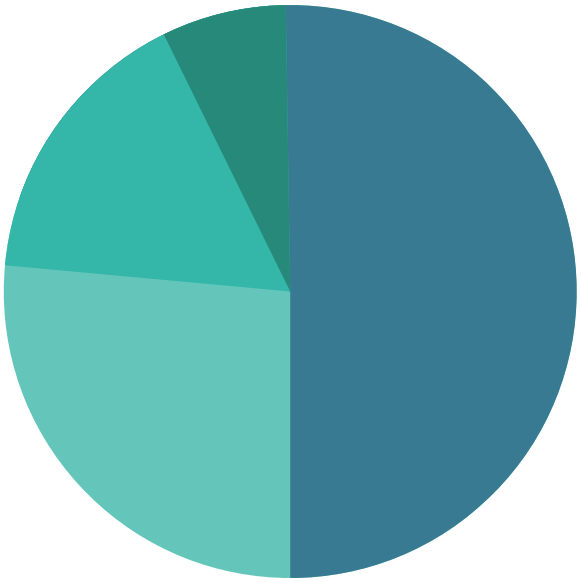


Figure 5. *. Percentage of total plastic waste collected for recycling, by regions, 2019*

Source of the data: *Database of OECD* ***stats.oecd.org***

As shown in Figure 5, in 2019 50% of the plastic waste collected globally for recycling was in the EU countries, while 26% was collected in Asia, Euro-Asia and the Pacific region, in the United States, Canada, Mexico, Latin American countries collected15% and African countries collected 9%.

Among the EU countries, Switzerland, Sweden, Austria, Germany, Belgium and the Netherlands recycled more than 50% of their annual waste, which demonstrating best practice for other countries .

European countries are leading in the recycling practice, and have been the first to implement incentive policies to promote waste separation and recycling, as well as measures to reduce the use of single-use products such as plastic bags and straws. In these countries, government regulation was important in the early stages of enforcing waste separation and recycling standards. Particularly, high fines and punishments were imposed if the standards were not followed. In the most severe cases, fines have exceeded $11,000, according to Global Recycling. If the results of the policy are expressed by Swiss statistics, they recycle 93% of glass waste, metal can waste (91%), and plastic bottle waste (83%), and also operate non-recyclable material incinerators and provide energy to households .

Sweden, which is at the top in waste processing among EU countries, imports waste from countries such as Great Britain, Italy, Norway, and Ireland. This waste is used to heat 950,000 houses and provides energy to 260,000 households through 32 waste-to-energy plants. Norway has also introduced waste-to-energy plants and has reached the level of importing waste from other countries .

China used to recycle up to 56% of the global plastic waste, and in doing so imported 60% of the waste from the United States, 70% of the waste from Europe, and waste from Asia and other countries. In July 2017 at the World Trade Organization meeting in Geneva, China, which was a central player of the Asian and global waste recycling business, announced that Beijing would reduce its imports of plastic and paper waste from other countries starting in 2018.

This decision completely changed the global waste recycling system and ushered in a new era of waste management. Half of the world's countries, including the United States, Canada, Europe, Japan, and South Korea, were forced to look for new landfills. In place of Chi-

[6], [7], [8] Global Recycle, 2022

na, Turkey and Malaysia have significantly increased the amount of garbage they import from other countries. Although China has imposed a ban on waste imports, it has not yet banned imports of recycled waste and pellets. As reported by some news sources, the import of pellets from China has increased dramatically, and strict control is being taken to ensure that standards are followed when the pellets are brought across the border.
In addition, the Chinese authorities are developing standards, rules and regulations for imported pellets .

SUB CONCLUSION:

- In recent years, the global production and consumption of plastic products has continuously increased and is expected to continue to increase. Due to environmental pollution and human health problems, countries are trying to recycle and use plastic waste and create a green economic structure without waste.

- While the global production and consumption of plastic products is increasing year by year, the share of primary raw materials in the input of plastic products has decreased and the share of secondary raw materials has increased.

- ince China, the main player in the business of recycling plastic waste, stopped importing waste from the beginning of 2018, most countries in the world are facing challenges in how to deal with their plastic waste. Turkey and Malaysia are replacing China's position and intensively importing waste from other countries for recycling.

- EU countries, including Switzerland, Sweden, Austria, Germany, Belgium, and the Netherlands recycle more than 50% of their plastic waste, becoming a best practice model for the world. These countries focused on not creating waste, recycled the already generated waste, incinerated the non-recyclable components to generate energy, provided energy to enterprises and households, and formed a green economic structure largely without waste.

- In 2016, Mongolia ranked 9th out of the top 10 countries in the world in terms of per capital plastic waste. We need to create a green economic structure that generates the least possible amount of waste, recycles the generated waste, and uses resources efficiently with minimal harm to human health and the environment.

2.2| EXISTING LEGAL ENVIRONMENT

This section of the report outlines the findings and results from the interviews with the relevant stakeholders, including the Ministry of Finance, the MCGA, the Mongolian National Recycling Association (MNRA) and other stakeholders. In Mongolia, the Mongolian Law on Waste was approved and came into force in 2017, and the law is followed by a total of 16 procedures, orders and rules in place. In 2022, under Caritas Czech Republic's project Sustainable Plastic Recycling in Mongolia (SPRIM), the Study on Improving the Existing Legal Environment of Plastic Waste" was conducted.

The study aims to assess the implementation of Joint Resolution # A-429/257 of Minister of Environment and Tourism and Minister of Finance. The study results show that the respondents/stakeholders barely have knowledge of the clause of order #A-429/259's annex, which specifies that producers and importers shall be responsible for the generated waste. The results of this study are similar to those of the previous study.

[9] Construction and Demolition Recycling, 2018

Producers and importers shall be responsible for waste generated: A producers and importers of plastic utensils, raw materials and plastic bags shall be responsible for collecting, reusing, recycling, and burying waste generated from products and their packaging. The provision has not yet been implemented, an effective enforcement strategy would contribute to reducing and recycling waste effectively.

Source: *Study on Improving the Existing Legal Environment of Plastic Waste*

Quote 1. *The results of the Study on Improving the Existing Legal Environment of Plastic Waste*

Also, the respondents highlighted the implementation of the law is lagging behind even if the necessary legal and regulatory environment is in place. This confirms the results of the previous study.

XThe legal environment for the waste management is generally in created. Most of the provisions are in line with the existing needs and market principles.

Эх сурвалж: *Хуванцар хаягдлын зохицуулалтыг сайжруулах өнөөгийн эрхзүйн орчны судалгаа*

Quote 2. *The results of the Study on Improving the Existing Legal Environment of Plastic Waste*

The government organizations emphasized that there is no mechanism to recycle waste and plastics and put it into economic circulation. The followings are named as the legal and regulatory constraints.

- **REGARDING THE IMPROVEMENT OF THE LEGAL ENVIRONMENT:** CThe surveyed professional association said that the implementation of the Mongolian Law on Waste 2017 will be ensured through monitoring. They also said the implementation of the law will be improved once responsible waste producers will be charged proportionally to the amount of the waste generated. They emphasized there is a need of adopting “Law on Eco-waste” and support entities that facilitate the law.

- **TAX INCENTIVES AND EXEMPTIONS:** To increase the competitiveness of domestic products, it is necessary to study the possibility of increasing import taxes on products such as electric pipes and sewer pipes, which can meet domestic needs and have a well-developed industry. There is a need to set a high tax on imported products of the same type as products made from recycled plastic waste after determining in detail the products that meet domestic needs and discussing them with the Tariff Council under the Ministry of Finance (MoF). There is a need to create a system of exemptions and discounts from customs and VAT.

- **ADOPTION OF STANDARDS:** It was said that the quality of the products produced by the factories varies because of the lack of standards. Therefore, the factories need to be asked to get a certificate of conformity and origin.

- **IMPROVING THE KNOWLEDGE OF THE LAWS AND REGULATIONS:** Entities tend to-sort the waste produced because of their lack of legal knowledge.

03 STUDY ON THE PLASTIC PRODUCT SUPPLY

The section summarizes the findings and results of the analysis of the supply side of recycled plastic products in Mongolia regarding capacity, resources, raw materials, market share, competition, and product value chain of plastic product manufacturers.

3.1 | PLASTIC RECYCLING POINTS, MARKET SHARE AND COMPETITIONS

In 2021, MNRA reported that there are 150 registered points and 14 unregistered points, totaling 164.

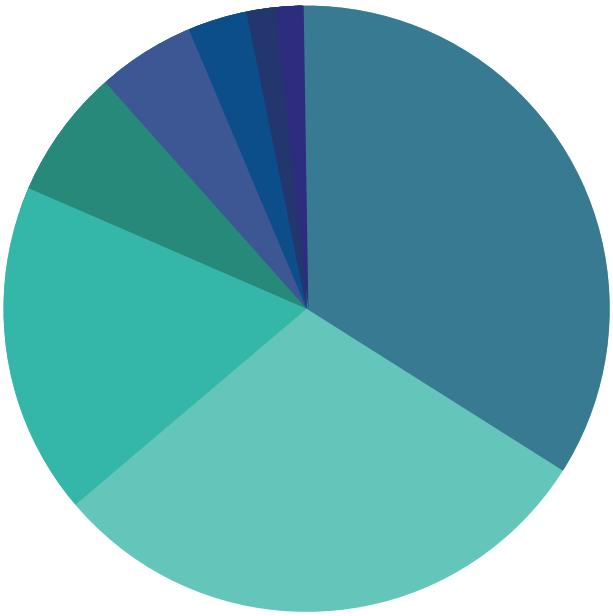


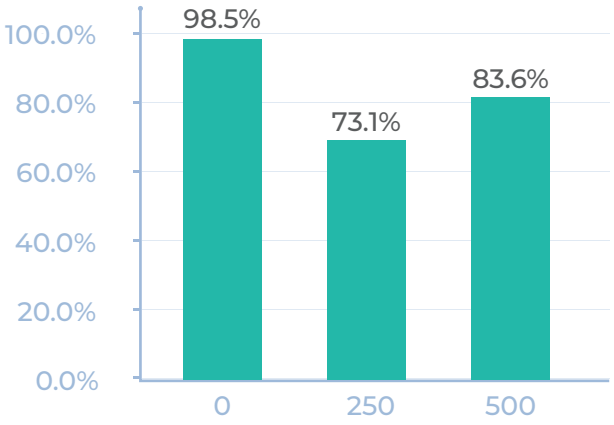
Figure 6. *Number of plastic recycling points, 2021*

SONGINKHAURKHAN	24
BAYANZURH	19
KHAN-UUL	11
BAYANGOL	5
CHINGELTEI	4
NALIAH	2
SUKHBAATAR	1
BAGANUUR	1

Source of the data: *MNRA*

Out of 150 recyclables' collection points, 44.7% (67 points) buy plastic secondary raw materials.Out of 67 plastic points that receive plastics, 64.2% (43) are in Songinohairkhan and Bayanzurkh districts. There are 11 points in Khan-Uul district, 5 in Bayangol district, 4 in Chingeltei district, while in Nalaikh, Sukhbaatar and Baganuur district there were only 1-2 points. (Figure 6)

Figure 7. *Proportion of the plastic waste collection points, n=67, 2021*



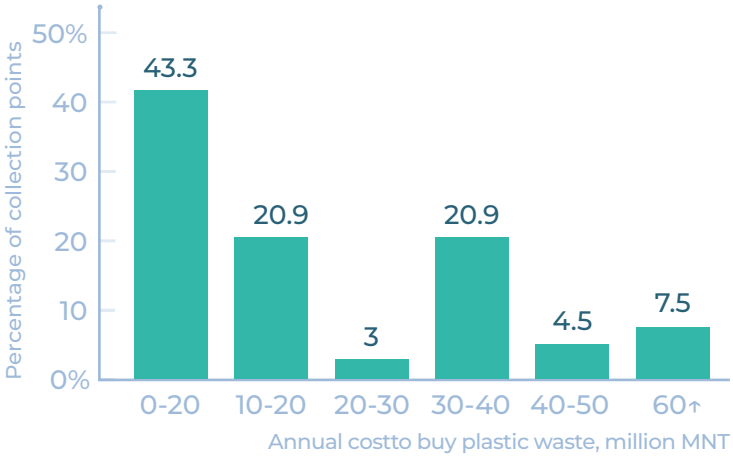
Source of the data: *MNRA*

The points that buy plastic raw materials commonly buy 3 types of plastic, including PET, HDPE, and PE. Out of 67 points, 98.5% collect PET or hard plastic, 83.6% collect LDPE plastic bags, and 73.1% accept HDPE and transfer it to recycling plants. (Figure 7)

As of 2021, outlets purchased **PET hard plastic at an average of MNT 191, HDPE soft plastic at MNT 457 per kilogram, and PE plastic bags at MNT 578 per kilogram.**

4.5% (3) of the 67 points supply collected waste to a single contracted factory while 32.8% (22) were not to a contracted factory, or they supply the product to random factories. The remaining 62.7% (42 points) either supply to a certain factory or choose a random factory.

Figure 8. *Value of the plastic waste, n=67, 2021*



Source of the data: *MNRA*

Figure 8 shows the total value of the plastic waste of 2021 of the plastic waste collection points registered in MNRA. 67.3% (out of 67 points) spent less than MNT 30 million, 25.9% spent MNT 30-50 million , and 7.5% (5) spent 60 million or more MNT. This indicates that the number of small enterprises in the area was high and larger ones are low in number.

3.2 | NUMBER OF PLASTIC RECYCLING PLANTS AND THEIR CAPACITY AND MARKET SHARE

As of 2021, 24 plastic recycling plants were registered in MNRA . They covered 19 of them to identify the existing situations, their capacity, and market share. One of them were not in operation yet. However, its plan on supply to the market was studied and used in the integrated results. The main results are from the data collected from 18 plants. The other 5 plants were currently not in operation or shut down.

The average duration of operation of the 18 plants was 9.3 years with an average employee age of 18 and income of MNT 1.07 billion MNT. In 2021, the plants earned a total of MNT 19.2 billion in sales revenue, of which one factory accounted for 31.3%. The following top seven largest plants accounted for 47.4% of total market sales combined, while the remaining 10 smallest plants made up 21.3% of total market sales.

Together, these 18 plants had an annual recycling capacity of approximately 18,500 tons of plastic. In 2021, 52.4% of this capacity was used. Particularly, the plant with the highest sales revenue used 85% of its capacity, while the other plants used 50.3% of their capacity. The plants recycled approximately 10,000 tons of plastic products in total.

In terms of annual production capacity, 5 of the 18 plants were able to produce less than 500 tons, 5 had a capacity to produce 501-999 tons, 3 had a capacity to produce 1000-1500 tons and 5 had a capacity to produce 1501+ tons. This is an indication of the different scales of the plants operating in the market.

Table 2. *Types of waste products, n=18*

№	Types of waste	of plants recycling	%, n=18
1	HDPE	12	66.7%
2	LDPE	12	66.7%
3	PE	10	55.6%
4	PP	6	33.3%
5	PVC	2	11.1%
6	PET	1	5.6%

Source of the data: *Primary data, 2022*

Table 2 shows the number of plants against types of the products they recycled. The most three common products included HDPE (66.7%), LDPE (66.7%) and PE (55.65%). On the other hand, 33.3% of the plants recycled PP, which is followed by the few PVC, PET, PPR recyclers.

10 (Dagmar Volo, Thomashinova, Thomash Foitik , September 2021)

Table 3 summarizes types of products produced by the 18 plants. The most common pellet products were HDPE and LDPE. 38.9% of the manufacturers (7) produced HDPE and LDPE pellets, 16.7% produced PP and PE pellets (3) and 1 plant made PET pellets, tubular glass blanks, and PVC pellets. As the MCGA reported in 2019, 4422.2 tons of HDPE pellets were imported into Mongolia. But according to research from plastic recycling manufacturers, they process a total of about 1,000 tons of HDPE pellets per year.
This demonstrates Mongolia's potential market capacity of increasing production volume by 4 times to replace imported HDPE pellets.

Table 3. *Types of the products, n=18*

№	Types of the products	Types of waste products	No of plants recycling	%, n=18
1	Pellets	HDPE, LDPE	7	38.9%
2		PP, PE	3	16.7%
3		PET, tubular glass	1	5.6%
4		PVC	1	5.6%
5		Garbage bag	6	33.3%
	End products	Electrical protection tub	3	16.7%
7		Clean and dirty water pipes	3	16.7%
8		Plastic chair	2	11.1%
9		Trench cover	2	11.1%
10		Packing bag	2	11.1%
11		Construction molding	1	5.6%
12		Household goods and souvenirs	1	5.6%
13		Vacuum window	1	5.6%
		Pallet	1	5.6%
15		Fence and pole	1	5.6%
16		Sealed pit toilet bowl	1	5.6%
17		Well	1	5.6%
18		Switch cover	1	5.6%
19		Plastic floor	1	5.6%
20		Canister /1,5,10 liter/	1	5.6%

Source of the data: *Primary data, 2022*

Garbage bags were amongst the most common products from the waste recycling. 33.3% of the manufacturers produced garbage bags. As the MCGA reported in 2019, garbage bags worth MNT 899.6 million were imported into Mongolia, with less than 0.5% produced domestically.

There were three factories each producing electrical protective pipes, clean, and dirty water pipes. **According to the statistics of 2019, MNT 29.54 billion worth of various pipes such as electrical protection pipes, clean, and dirty water pipes, were imported across the border of Mongolia. Plastic recycling plants have the potential to produce substitutes.**

2 manufacturers each produced plastic chairs, trench covers, and packaging bags. 1 manufacturerer each produced construction moldings, household goods, souvenirs, vacuum windows, plastic pallets, searchlights, poles, sealed containers for pit toilets, wells, switch covers, plastic floors, and canisters. In 2019, MNT 8.6 million worth of chairs were imported, and in the category of various packages more than 1,026 MNT were imported (more than MNT 1,026 billion). This demonstrates Mongolia's potential capacity to supply products that could displace these imports.

Shown in Figure 9, 27.8% of the manufacturers had been operating for less than five years, and 66.7% have been operational for less than 10 years (66.7%). This indicates their contribution to market expansion in the past 10 years.

As illustrated in Figure 10, the number of employees was usually low because many companies are relatively new. 61.1% (11) of the manufacturers had fewer than 19 employees, 33.3% (6) of the manufacturers had 20-34 employees and the remaining manufacturer had more than 35 staff.

Figure 9. *Years of experience in the industry, n=18*

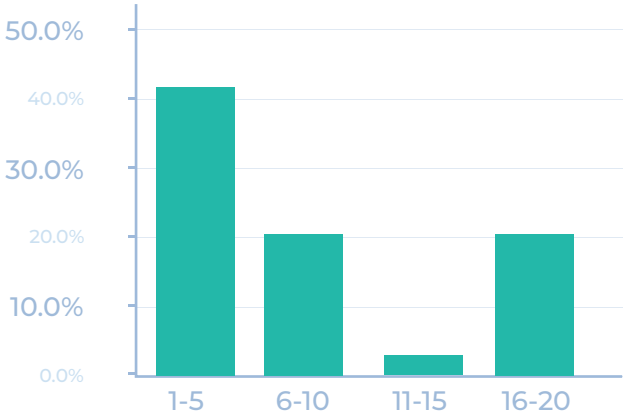
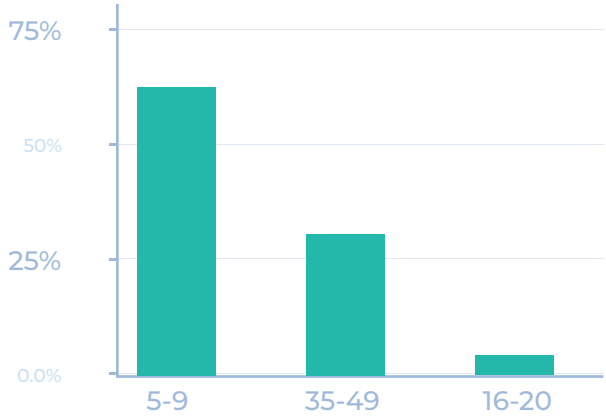


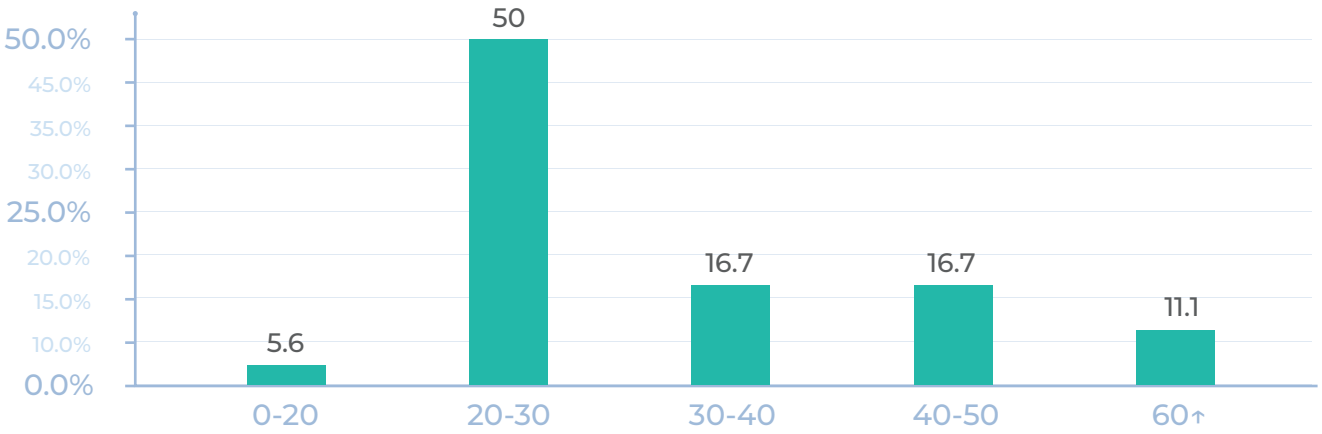
Figure 10. *Number of employees, n=18*



Source of the data: Primary data, 2022

Figure 11 shows the capacity utilization rate of the surveyed manufacturers. In 2021, 8 of them used 30-49% of their capacity, 2 used more than 90% of their capacity, 3 used 70%-89% of their capacity , 3 used 50%-69% of their capacity and 1 used less than 29% of their capacity.

Figure 11. *Capacity of the manufacturers in use, n=18*



Source of the data: *Primary data, 2022*

The statistics above show that plastic recycling plants could not use their full capacity and the utilization rate remained insufficient. If their utilization rate goes up, their production of plastic products increase.

MATERIALS AND EQUIPMENT:

The products, namely rebar spacers, fans, BarL (vertical rebar spacers), large and small housings, electrical protection pipes, garden chairs, installation profiles, corner connectors, plastic pipes, canisters, sewage pipes, PVC MP70 frames, HDPE MP70 presses, PVC MP70 winder, PVC MP70 crossbar, post, connector, purlin, artificial square, concrete chemical admixture, retaining film, collet, manhole set, riser, wrap film, vacuum window blank, beverage container, water outer packer, curb border were produced.

HOUSEHOLD PRODUCTS:

Household products included trash bags, chairs, household cleaning oils, and biodegradable bags.

HYGIENE PRODUCTS:

Urinalysis container and pit latrine linings.

SEMI-FINISHED PELLETS AND RAW MATERIALS:

They were namely PP, HDPE, and LDPE.

33.3% (6) of the manufacturers got their secondary raw materials from a contractor, 11.1% (2) sourced them through secondary resource collection points, and 55.6% (12) had no specific preference over a supplier. They, for instance, collected their raw materials from recycling centers, contractors, stores, or private waste collectors. 18 manufacturers purchased a total of 8737.2 tons per year for an average of 485.4 tons of secondary raw materials per factory. 72.2% (13) bought below the average amount, and 18.2% (5) performed above the average.

Figure 12. *Supplying countries of virgin plastics, n=18*

Source of the data: *Primary data,2022*

45% (8) of the manufacturers did not import primary raw materials such as chemical additives or pure plastic pellets. 33% (6) import only from China and only 11% (2) import from South Korea. 11% (2) of the manufacturers imported primary raw materials from both China and South Korea. In terms of the volume, the total amount of primary raw materials imported was 1541.5 tons per year, of which 48.4% was imported from China and 51.6% from South Korea.

It is seen that compared to China, the number of manufacturers that imported primary raw materials from the South Korea was lower.
Despite this, those manufacturers that are importing from South Korea do so at a scale greater than the companies importing from China

Figure 13 and Figure 14 the satisfaction of the manufacturers with the quality, features, and pricing of their own and competitors' products. 39% of them evaluated the competitor's product as "good", while their own product "very good or good" (90%). They were more satisfied with their own products than those of the competitors.

Figure 13. *Satisfaction with the quality, feature and pricing of the competitors' products, n=18*

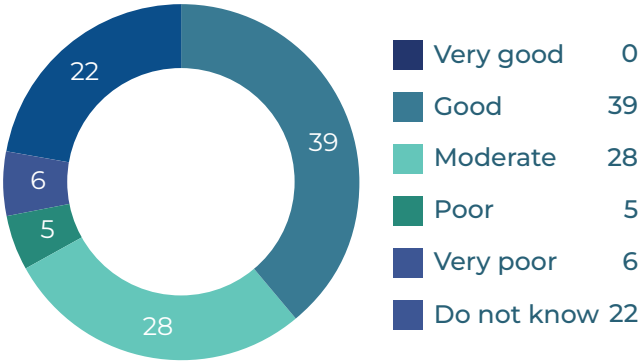
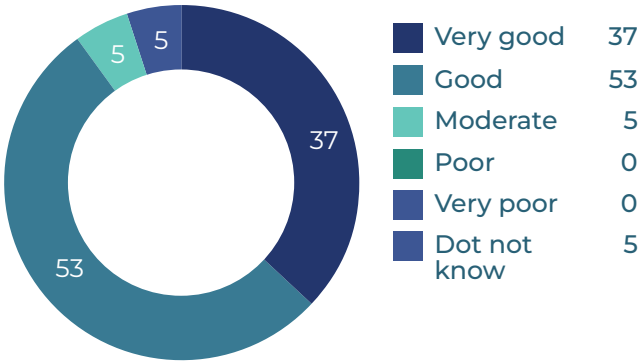


Figure 14. *Satisfaction with the quality, feature and pricing of own products, n=18*



Source of the data: *Primary data, 2022*

3.3 | NEW PRODUCT NEEDS AND PLANS

50% of the manufacturers expressed their interest in increasing the variety of products and improving their quality, while the rest said that they did not have any plans, or they did not want to share if they would add the variety of products because of the confidentiality of the organizations. The former groups intended to produce electrical protection pipes, pipes, nets with logos, plastic sewer pipes, drainage pipes, shovels, tampon containers, molds, and animal watering tubs.

83.3% (15) of them, were interested in expanding their operations by adding to the current production lines and stages. This needs financial resources, and the additional plastic processing and molding would allow the production of the all kinds of plastic products.
With the manufacturers' improvement of equipment and capacity, plastic and wood shavings can be mixed with special technology to make outdoor terrace floors, outdoor setkan cushions, electric pipe connectors, pipes with metal interior, switch socket caps, grass ropes, clean and waste water pipes, bags, sacks, other types of cables, plastic pipe accessories, ventilation pipes, deep wells, building panels, stairs, plastic roofs of houses, and fence posts for agriculture can be produced.

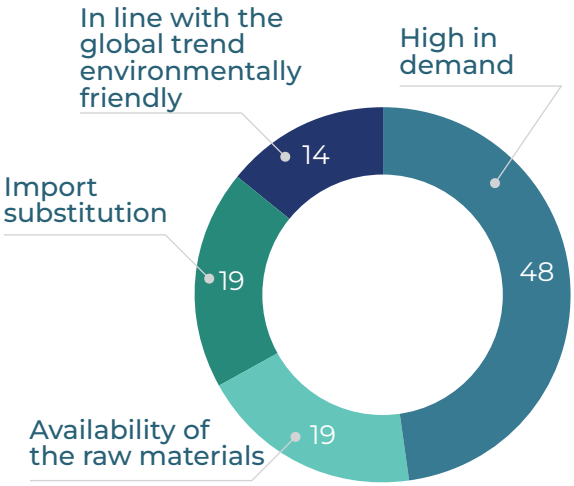
The surveyed manufacturers intended to produce and introduce the following products to the market in the next five years.

- Wide pipes for internal sewage lines and sewage wells
- Building plastic panels to replace the plastic roof of the house and the currently used black paniar
- Recycling plant
- Electrical pipe connectors, pipes with metal interior, switch socket caps, and grass ropes
- Agricultural fence posts, shovels, general purpose sacks
- Self-produced pipe fittings and plastic pipes
- Improving the feature and quality of the existing products
- Introducing new technology to produce products for roads and agriculture by mixing plastic with rubber, and to introduce standards in Mongolia for this process. This would need support from policy makers, donor organizations, and other stakeholders.

Figure 15 shows the motivation for planning to have new products. The prevailing reason was market demand and needs. This was followed by the reasons of availability and adequacy of the raw materials, replacing imports, and global trends of environmental awareness.

The constraints faced by manufacturers in recycling and introduction of plastic into the market were identified and grouped into four categories: technology, supply of raw materials, sales, and user's attitudes.

Figure 15. *Reasons of planning to produce new products*



Source of the data: *Primary data, 2022*

LEGAL AND REGULATORY ENVIRONMENT ISSUES:

- The implementation of the laws and regulations on waste products and sorting should be improved. Sorting would contribute to increasing availability of the raw materials and improving the supply.
- It is necessary to improve citizens' and enterprise experts' knowledge of the governing laws and regulations on waste management. The lack of awareness of regulatory obligations leads to waste generators' handing over hazardous waste to landfills.
- Standards and requirements for the products manufactured from the secondary raw materials should be adopted and followed. In particular, the production of food and hygiene products from secondary raw materials produced from hazardous waste should be prohibited. Some manufacturers mix secondary raw materials with primary raw materials to make food containers, and regular inspection from the government organization is missing.

- Some of the government policies could not reach the target groups. For example, the manufacturers could not qualify for the small and medium-sized enterprises (SME) support loan with 3% interest rate.

- The implementation of government policies and regulations regarding foreign trade policy, export and import was not fully ensured. Despite the claimed import tax exemption for some products and equipments, the provision is not implemented in practice regarding the equipments for the recycling plants.

- The process of license extension is too lengthy and bureaucratic. Therefore, the validity period of special licenses should be lengthened and requirements for the extension should be lowered.

- The GoM should provide incentives and support for waste recycling. It is estimated that MNT 2700 is spent on burying 1 kg of ordinary garbage. There is no incentive system for saving this cost and using waste to produce products and put them into economic circulation.

- High transportation costs, electricity costs, customs duties and VAT reduce the viability of the plastic recycling industry in Mongolia.. Mongolia should exempt tax and provide energy incentives on production of such products like other countries.

- The government should pay more attention to the implementation of standards and requirements for the work environment of workers in hazardous conditions at recycling factories and work together with SMEs. For example, a waste recycling plant requires a larger area than other plants.

- It is difficult for SMEs to operate if they do not have their own factory premises. Other inspection organizations, such as professional inspections, have very high requirements for factories, and it is difficult for secondary raw materials factories to create the environment they are asked to have. And the law enforcement is not followed equally. Some similar foreign-invested industries are seen to follow not strict requirements.

TECHNOLOGICAL ISSUES:

- Due to the lack of specific standards for food packaging and the lack of clarity on what ingredients and levels of recycled plastic can be used in food production, some manufacturers are producing products with uncertain guarantee of health and safety of human.

- Steam supply is a necessary input for producing synthetic fiber out of PET using steam technology. A special license is required to get the steam supply, and the process is complicated. Without steam supply, PET material cannot be synthesized. However, without a special license, it is not possible to synthetic fiber coming out of the steam. In this case, both technological and regulatory issues are present.
  Skilled and experienced engineers are in demand. There is a need to empower employees to upskill and attract investment to scale up.

- The manual steps should be replaced with automatization and technology.
- The manufacturers need to have their own factory premises and update their equipment and technology.

ISSUES WITH SUPPLY OF RAW MATERIALS:

- At present, most of the raw materials are bought through dealers and sorting remains insufficient. Besides campaigns on waste sorting, the government coordination is lacking. A triparty (public, private and citizen) engaged solution is needed.
- Because of lack of integrated government policy and coordination, it is difficult to get raw materials from the market. The availability of raw materials and prices fluctuate.
- There are 2-3 dominant companies in the supply of raw materials and they increase their prices at will. Yet, their sorting and quality of the products can't meet the standards.
- Transportation logistics are very complicated. Transportation costs have increased.
- Customs duty is high. Importing is difficult and time-consuming because of the customs procedures.

SALES RELATED ISSUES:

- Not all sales can be made by monetary payment, where the products are exchanged commonly for other goods or services. This is especially true in the construction industry. In this case, there is a shortage of working capital.
- Marketing is in need. Particularly, finding the right marketing channel is important. Although the MSMEs often use Facebook for marketing, it may not reach their target audience. An integrated government policy is necessary for promoting the MSME activities.
- Due to the rapid growth of inflation, it is difficult to price products at a price point the meets end users' expectations.

The government support is lacking in terms of increasing sales.

ISSUES WITH USERS' ATTITUDE AND PERCEPTION:

- The numbers of users choosing recycled products has increased dramatically in recent years. Because the costumers' willingness to buy such products made domestically, there is little chance of resistance from the users.
- Some users are skeptical of the quality of the domestically made products. Once they feel the quality of domestically made products, they tend to continue buying the products.

Most of the manufacturers (88.9%), 16 manufacturers, sell their products to business consumers, which makes up 72% of the total finished products. 5 of them sell their products to both business consumers and individual consumers and 1 manufacturer sells its products to only individual consumers (1).

8 manufacturers sell their products to wholesalers, while only 1 manufacturer exports 50% of its products, and 1 manufacturer supplies 10% of its products to government agencies. (Table 4)

Table 4. *Supply channels of the recycled products, n=18*

№	Buyers	No. of producers	%
1	Business consumers	16	88.9%
2	Individual consumers	5	27.8%
3	Wholesome distributors	8	44.4%
4	Export	1	5.6%
5	Government organizations	1	5.6%

Source of the data: *Primary data, 2022*

The majority of pellet manufacturers sell their products to business consumers under contract. Specifically, 5 out of 7 manufacturers of pellets, or 71.4%, supply their products to business consumers under contract. Of the the remaining manufacturers, one supplies its products to end costumers and the other to wholesalers. Among the pellet manufacturers, one company produces plastic pellets for export.

72.2% (13 out of 18) of the manufacturers receive their user feedback to design products, and mainly follow user-ordered production, product quality research, and user satisfaction survey to improve product quality, or reflect user feedback and improve their operations.

3.4 | MARKET ENVIRONMENT FOR RECYCLED PLASTIC PRODUCTS

All the 18 manufacturers were located in Ulaanbaatar. They sell their products in Ulaanbaatar. Only one of them is exported, while 14 of them (77.8%) are also selling in rural areas. (Table 5)

Table 5. *Location of the recycled plastic products, n=18*

№	Sales location	No. of producers	%
1	In export	1	5.6%
2	Ulaanbaatar, Mongolia	18	100.0%
3	Provinces, Mongolia	14	77.8%

Source of the data: *Primary data, 2022 2022*

Table 6 summarizes sales channel information for recycled products. The majority of producers (88.9%) sell from their own factories, while half (50%) sell through contracted distributors. There are 6 (33.3%) factories selling at the market. 1 factory uses Facebook

for sales. The results of the study proved that producers of recycled products do not use supermarkets, chain supermarkets, small shops, mini markets, and online stores.

Table 6. *Sales channels of the recycled plastic products, n=18*

№	Sales channel	No. of manufacturer	%
1	From factory to end costumer	16	88.9%
2	Subcontractor	9	50.0%
3	Market	6	33.3%
4	Facebook	1	5.6%
5	Chain stores	0	0.0%
6	Супермаркет	0	0.0%
7	Supermarket	0	0.0%
8	Small shops	0	0.0%
9	Online shop	0	0.0%

Source of the data: *Primary data, 2022*

Almost all of the manufacturers (17 of the 18) had cooperation agreements with users for bulk and direct purchase of their manufactured products. The remaining 1 producer said that there was no need to make such a contract because they sell their products directly in cash.

52.9% of manufacturers with cooperation agreements for selling their products have 1-10 users, 17.6% have 11-50 users, 23.5% have 50-100 users, and 5.9% have more than 100 users. (Table 7)

Table 7. *Number of manufacturers with a cooperation agreement with users, n=17*

№	No. of users with a cooperation agreement	No. of manufacturers	%
1	1-10 users	9	52.9%
2	11-50 users	3	17.6%
3	50-100 users	4	23.5%
4	More than 100 users	1	5.9%

Source of the data: *Primary data, 2022,*

As can be seen from the table, the manufacturers sold almost all of their products under cooperative agreements to factories and contracted distributors.

Recycled plastic manufacturers price their products based on the cost of the product, the similar product prices offered for both domestically made and the imported products. Most of the manufacturers (77.8%) price their products based on the cost of the products. (Table 8)

Table 8. *Pricing principles, n=18*

№	Pricing principles	No. of manufacturers	%
1	Based on product cost	14	77.8%
2	Based on the price of similar domestically made products	4	22.2%
3	ИBased on the price of the similar imported products	3	16.7%
4	Based on the agreement made with a contractor	2	11.1%

Source of the data: *Primary data, 2022*

The manufacturers surveyed said that they strived to supply the market taking the following factors into consideration: product quality, hygiene, safety, availability, continuous supply, product variety, and competitive price.

76.5% of producers said that their product quality was what made their products stand out. This is followed by the product features unique in Mongolia, use of latest technology, environmentally friendliness of the products, neuralization of the harmful chemical waste, and having a certificate of conformity. In addition, the manufacturers highlighted the importance of having good equipment capacity, improving sorting and quality, supply, product features, government support, increasing the number of stores and promotion activities to increase their sales volume. Among the above-mentioned factors, improving the equipment and production capacity, ensuring the quality and stable supply of raw materials were mentioned the most by the manufacturers. (Table 9)

88.9% of the manufacturers (16 of 18) believed that the domestically made recycled plastic products were able to replace and compete with imported products. Users preferred to buy domestically made plastic products because of their quality and competitive price. For the remaining 2 manufacturers, the same type of products were imported almost without duty, and the problems with supply of raw materials made the users complain about the products. This made them skeptical about replacing the imported products.

In order to further increase their sales in the market, the manufacturers need to acquire knowledge and skills in marketing, advertising, social media content development, and legal aspects of hazardous waste. They also expressed their need to learn from the international practice and standards to compete internationally.

Table 9. *The activities should be done to improve the sales volume, n=18*

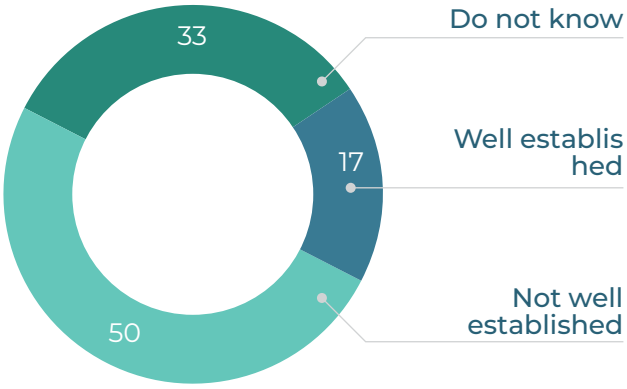
№	Activities	No. of producers	%
1	Improve equipment and capacity	7	38.9%
2	Quality of raw materials and their stable supply	4	22.2%
3	Improve product features	3	16.7%
4	Government support	3	16.7%
5	Improve quality	2	11.1%
6	Increase the number of stores	2	11.1%
7	Promotion activities	2	11.1%
8	Increase variety of products	1	5.6%
9	Change ingredients	1	5.6%
10	Offer discount	1	5.6%
11	Increase price options	1	5.6%
12	Add brand types	1	5.6%

Source of the data: *Primary data, 2022*

3.5 | PLASTIC IMPORTER'S AND DISTRIBUTOR'S KNOWLEDGE AND UNDERSTANDING ABOUT RECYCLED PRODUCTS

As a part of the survey, we collected data from managers and retailers of plastic product and evaluated their knowledge and attitudes about recycled products and their domestic manufacturers.

Figure 16. *Knowledge and understanding of the existing manufacturers' capacity, resource of the importers and distributors, n=18*



Source of the data: *Primary data, 2022*

17% of the surveyed manufacturers said that the domestic manufacturers were relatively well-established, and half replied that domestic manufacturers were not well-established. A third of them said that they had no knowledge and information about the resources, opportunities and capacity of the other recycling plants.

Distributors who considered the recycling industry to be relatively well-organized were more familiar with products such as gray foundation pipes, containers, and garbage bags.

Mongolia does not have resources and opportunities for recycling. Plastic pipes are used only for sewage drainage. I don't know where and how it is sold. There are no featured products.

From interviews with plastic importers and distributors

There is a lack of recycling plants and insufficient resources. Basically, there are only two manufacturers. They make plastic caps, cushions, car wheel hubs, collars, necks and poles. When ordering, the capacity is overwhelming and insufficient. So, I think there should be a factory in addition.

From interviews with plastic importers and distributors

The supply sometimes cannot meet the demands. As for the gray pipe of the line, it becomes less available when the repair work of the line starts in the summer. So, I think that the capacity and resources are poor.

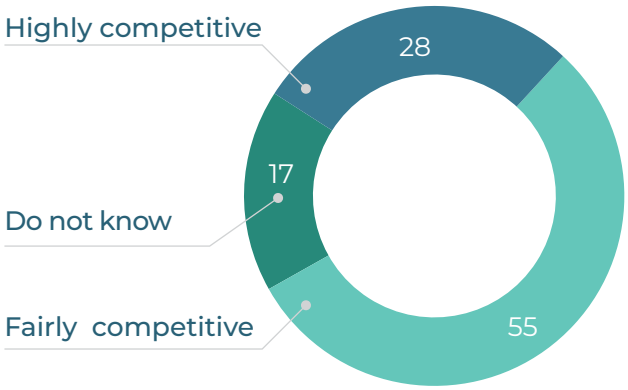
From interviews with plastic importers and distributors

Mongolia does not have resources and opportunities for plastic recycling. During the summer months, the supply is cut off. I don't know the reason. The number of buyers increases, raw materials are not available, or they cannot bear the load. When there are many buyers, plastic bags are not available... They come with poor quality and design. Sometimes it doesn't sell. It is made in only one color. Everyone will support the domestic industry if it has good feature and color choices like imported products such as ones from Russia. The domestically made ones sometimes have a lot of defects.

From interviews with plastic importers and distributors

Quote 3. *Importers and distributors' attitude regarding capacity, resources, and opportunities for recycling and production of plastic products.*

Figure 17. *Distributors 'evaluation on the competitiveness of the domestic products with the imported products, n=18*



Source of the data: *Primary data, 2022*

As shown in Figure 17, 55% of the surveyed manufacturers evaluated their competitiveness as fairly competitive. They said it was because of the quality of the products, features and price. 28% of them said domestically recycled products were cheaper and of better quality than imported products.

The surveyed distributors expressed their willingness to support domestic production if they expand their production capacity and equipment, improve product quality, and increase their variety of product options. With the primary knowledge of the users' needs, the surveyed importers and distributors said the following products need refinement and development.

> The manufacturers tend to expect the distributors to sell the products with almost the same price as it is sold. The distributors want to make a profit. Thus, the manufacturer's needs make the products with less cost. If a product cannot be competitive in terms of its price, people don't buy it.
>
> *From interviews with plastic importers and distributors*

Quote 4. *About the price offered*

- ☑ Water storage tanks, large and small containers for food and plants
- ☑ Large, small, thin and thick bags and nets
- ☑ Chairs and tables for household and public areas
- ☑ Street poles, fences, road gutters and brooms for outdoor areas
- ☑ All kinds of pipes such as foundation PPR pipes, ventilation pipes, ventilation valves, ventilation caps, headers, rigid turbos, water hoses, water jets, mud polishers, shifatals, mud pullers, expander bolt brackets, plaster expanders, wind deflectors, roller stems, construction tools and materials such as knobs, sockets, shovels, shovel handles, light switches, sockets, plastic clips, wire covers, automatic plastic boxes, plastic window sills, ceiling and wall lamps, siphons, toilet seat clamps, and drains.

Importers and distributors listed the following as the supply and demand challenges in the production of plastic products.

- ☑ Frequent border closures and disruption of supply hinders the production of domestic plastic products. This needs a financial solution.
- ☑ The domestically made plastic products should be compliant with industry standards.
- ☑ The domestic manufacturers lack capacity and often don't deliver orders on time. This is because of the lack of knowledge and skills in the existing human resources, lack of skilled workforce, such as engineers and technicians who can work in the harsh and harmful conditions, and the limited availability of primary and secondary raw materials.
- ☑ Lack of the promotion activities, the potential users have little knowledge of the products. They have no knowledge of the domestically made plastic products.
- ☑ Poor capacity for mass production also became an issue. If orders were made in August and September, hardly no manufacturers were available.

There were no incentives for selling domestically produced plastic products. It was not common for some contract distributors to borrow goods from the manufacturers. Also, the manufacturers sometimes did not honor their obligations of rewarding the distributors for bulk sales.

Chinese manufacturers offered a lot of price and non-price discounts and incentives to distributors. It was not common that the domestic manufacturers reduce prices, provide discounts and incentives. Thus, the following incentives and discount could increase the sales of the domestic plastic manufacturers.

- Allowing post-pay to a regular distributor and offering the lowest possible price.
- Offering lower price than it was in the market, giving discount for bulk sales
- Offering bonus depending on the sales revenue.
- Offering free delivery.

3.6 | THE EXISTING SITUATIONS OF IMPORTING

Mongolia imports plastic products and raw materials from more than 80 countries, and the amount of imports tended to increase in recent years. Table 10 shows the data of the top 10 suppliers in 2018 and 2019 as reported by the MCGA. China topped the list with the supply of two thirds of imported plastic products. South Korea, Russia, the United States, and Australia followed the list.

Table 10. *Origin of the imported plastic products, baseline assessment*

№	Origin	2018 он		2019 он	
		Baseline assessment, million MNT	%	Baseline assessment, million MNT	%
1	China	197 616.95	68.8%	233 915.20	65.8%
2	Korea	20 892.80	7.3%	25 202.12	7.1%
3	Russia	15 471.89	5.4%	24 315.22	6.8%
4	USA	6 355.02	2.2%	8 234.69	2.3%
5	Australia	5 100.84	1.8%	7 326.88	2.1%
6	Germany	5 973.14	2.1%	6 215.76	1.7%
7	Italy	3 760.89	1.3%	4 542.97	1.3%
8	Japan	3 406.96	1.2%	4 100.68	1.2%
9	Switzerland	153.98	0.1%	3 264.17	0.9%
10	Malaysia	3 955.67	1.4%	3 074.88	0.9%
	Other	24 526.45	8.5%	35 246.74	9.9%
	Total	**287 214.58**	**100.0%**	**355 439.33**	**100.0%**

Source of the data: *MCGA*

Table 11. *TOP companies that import goods and materials, 2019*

№	Name	Baseline Value Million, MNT	%
1	HMNH LLC FIE	30234	8.5%
2	APU LLC	10962	3.1%
3	Vitafit-Invest LLC	10343	2.9%
4	MSM group LLC	6407	1.8%
5	Obplastic LLC	6112	1.7%
6	Dulaan khuus LLC FIE	6002	1.7%
7	Tsonjai LLC FIE	5933	1.7%
8	Oyutolgoi LLC	5610	1.6%
9	MSM Group LLC FIE	4883	1.4%
10	Kemex LLC	4869	1.4%
11	Spirt Bal Buram LLC	4795	1.3%
12	MAK LLC	4711	1.3%
13	MCS coca-cola LLC	4040	1.1%
14	Brothers Industry LLC FIE	3910	1.1%
15	Tsetszam Plast LLC	3812	1.1%
16	TML FIE LLC	3695	1.0%
17	Domog International LLC	3564	1.0%
18	Monpack Trade LLC	3309	0.9%
19	Climax-International LLC	3182	0.9%
20	Rostorgo LLC FIE	3166	0.9%
21	Pyramid Industry LLC	3136	0.9%
22	Suldshonkhor LLC	3094	0.9%
23	M Plastic LLC FIE	3050	0.9%
24	Individual	2773	0.8%
25	MSC Property LLC	2736	0.8%
26	Sky supermarket LLC	2612	0.7%
27	Fencenter Mongolia LLC	2200	0.6%
28	Ondylt LLC	2198	0.6%
29	APU dairy LLC	2190	0.6%
30	Enkhted LLC	2148	0.6%
31	Nomin Trading LLC	2122	0.6%
32	Aiviko -International LLC	2113	0.6%
33	Mongolnew Plastic LLC	2100	0.6%
34	Multipack LLC	2097	0.6%
35	Nyagtkhuus LLC	2096	0.6%
36	SUU LC	2071	0.6%
37	Majordrilling Mongol LLC FIE	2026	0.6%

№	Name	Baseline Value Million, MNT	%
38	Khun Tai Industry LLC	1949	0.5%
39	Suntsaitianma LLC FIE	1875	0.5%
40	Jienbeverejes LLC	1646	0.5%
41	Tavinlin LLC	1598	0.4%
42	Enkhiin Shuuder LLC	1436	0.4%
43	SUU LLC	1382	0.4%
44	GEM International LLC	1380	0.4%
45	Gobi Khangai Buidan LLC	1372	0.4%
46	Shundaya LLC	1249	0.4%
47	Ulemj LLC	1230	0.3%
48	Monos cosmetic LLC	1221	0.3%
49	Wagner Asia LLC FIE	1191	0.3%
50	Best Buidan LLC	1176	0.3%
51	KHKU LLC	1171	0.3%
52	Petro China Dachin Tamsag LLC	1168	0.3%
53	Khugjil Trade LLC	1164	0.3%
54	Doechevella LLC	1163	0.3%
55	Nomin Misheel LLC	1154	0.3%
56	Pyramid Industry LLC	1143	0.3%
57	Avidiin Erdene LLC	1127	0.3%
58	Itgeltbuuhia LLC	1118	0.3%
59	Batjinatrade LLC	1117	0.3%
60	MIAT LC	1087	0.3%
61	Mitsjalan LLC	1068	0.3%
62	Unguttumur LLC	1059	0.3%
63	Water management Department Local owned enterprise	1056	0.3%
64	NOTS LLC	1041	0.3%
65	MCM Group FIE LLC	1015	0.3%
66	Green international LLC	984	0.3%
67	Electriccom LLC	976	0.3%
68	Narantuul trade LLC	967	0.3%
69	TsBON LLC	947	0.3%
70	BBII LLC	931	0.3%
71	Vitafit milk LLC	927	0.3%
72	Uguuj chiher boov LLC	901	0.3%
73	Moninjbar LC	891	0.3%
74	Termigas impianty technology LLC FIE	884	0.2%
75	Atar-Urgoo LC	843	0.2%

Source of the date: *MCGA*

The top 10 companies imported goods and materials equal to a quarter of the total base amount. The list is headed by HMNH LLC, followed by APU, Vitafit-Invest, MCM Group, Obplastic, Dulankhuuss, Tsonjai, Oyutolgoi, MSM Group with FIE and Kemex.
HMNH LLC, a foreign invested enterprise (FIE,),imported onlywhite cylindrical tablet shaped plastic pellet raw material with code 39076100 for beverage bottles in 2019 in a large quantity.

In 2019, APU LLC imported 40 types of plastic goods and materials worth MNT 10962.2 million, 65.8% of which were alcohol corks, 12.9% were plastic film labels, 5.5% were plastic chests and 5.3% were plastic beer caps. (Table 12)

Table 12. *Goods imported by APU LLC, 2019*

	Goods and materials	Base Value, million MNT	%
1	Alcohol cork	7211.1	65.8%
2	Heat label	1416.0	12.9%
3	Box	598.7	5.5%
4	Beer stopper	585.2	5.3%
5	Plate	217.0	2.0%
6	Beer stabilizer	200.3	1.8%
7	Pallets	177.5	1.6%
8	Caps	160.9	1.5%
9	Water caps	130.3	1.2%
10	Seal of the caps	97.9	0.9%
	Other	167.4	1.5%
	Total	**10 962.2**	**100.0%**

Source of the data: *MCGA*

In 2019, Vitafit-Invest LLC imported 35 types of plastic goods and materials worth MNT 10,342.7 million, 56.3% of which were polyethylene terephthalate, 16.3% juice labels, 7.8% were plastic stoppers, 4.7% were plastic labels, and 4.1% was polymer film. (Table 13)

Table 13. *Goods imported by Vitafit-Invest LLC, 2019*

	Goods and materials	Base Value, million MNT	%
1	Polyethylene terephthalate	5825.7	56.3%
2	Labels on beverage bottles	1688.1	16.3%
3	Plug	810.3	7.8%
4	Plastic label	484.3	4.7%
5	Polymer film	422.4	4.1%
6	Pellet and water tank	302.4	2.9%
7	Packaging film	149.4	1.4%
8	Plastic stopper	149.4	1.4%
9	Glossy film	130.5	1.3%
10	Plastic label roll	82.5	0.8%
	Other	380.3	3.7%
	Total	**10342.7**	**100%**

Source of the data: *MCGA*

As seen from the above-mentioned information, the majority of imported goods are water and beverage bottle blanks, raw materials, stoppers, labels, seals, polyethylene terephthalate, and plastic film.

In 2019, Mongolia imported about 7,000 types of plastic goods and materials. Table 14 summarizes the list of the most imported goods and materials with the highest value and the main types of products planned to be produced by domestic manufacturers in the future. The base value of these 20 goods and materials constitutes 83.68% of the base value of all goods and materials imported in 2019, and most of them were ingredients, raw materials and auxiliary materials used in production.

Table 14 shows the names of products that domestic plastic recyclers and manufacturers plan to produce in the future. The list was based on the 2019 data provided by the MCGA. The spread of the COVID-19 pandemic resulted in disruption of the cross-border trade in early 2020. Since this situation has not stabilized, the data of 2019 is considered to be the most accurate. Also, the MCGA uses different measurements on amount of goods and materials, which include kilograms, pieces, meters, and square meters. The ton was used as measurement given in the questionnaire. As of 2019, at least 47,340 tons of plastic products were imported into Mongolia.

Table 14. *Imported goods and materials, quantity, 2019*

№	Goods and materials	Quantity, by tons	Base Value, Million MNT	%
1	Polyethylene	16260	55511.8	15.62%
2	Polystyrene	11164	35643.8	10.03%
3	**Various pipes**	**6047**	**30597.2**	**8.61%**
4	**Various plastic blanks**	**2600**	**22999.1**	**6.47%**
5	Plug	50	22427.7	6.31%
6	Film	3476	22139.5	6.23%
7	Pot	357	19862.4	5.59%
8	**Bay**	**666**	**16320.2**	**4.59%**
9	Plate	1029	15102.0	4.25%
10	Window	484	11285.4	3.18%
11	Wax cloth	412	9651.7	2.72%
12	Polymer	1808	9334.8	2.63%
13	**Floor**	**55**	**8383.3**	**2.36%**
14	Label	374	7795.3	2.19%
15	Polyacrylamide	1045	5746.7	1.62%
16	Sponge	500	4296.9	1.21%
17	**Seedling pot**	**8.2**	**327.7**	**0.09%**
18	**Shovel**	**NA**	**8.8**	**0.002%**
19	**Plastic chair**	**NA**	**8.6**	**0.002%**
20	**Garbage bag**	**NA**	**5.1**	**0.001%**
	Other	NA	57991.5	16.32%
	Total	**47340**	**355439.3**	**100.00%**

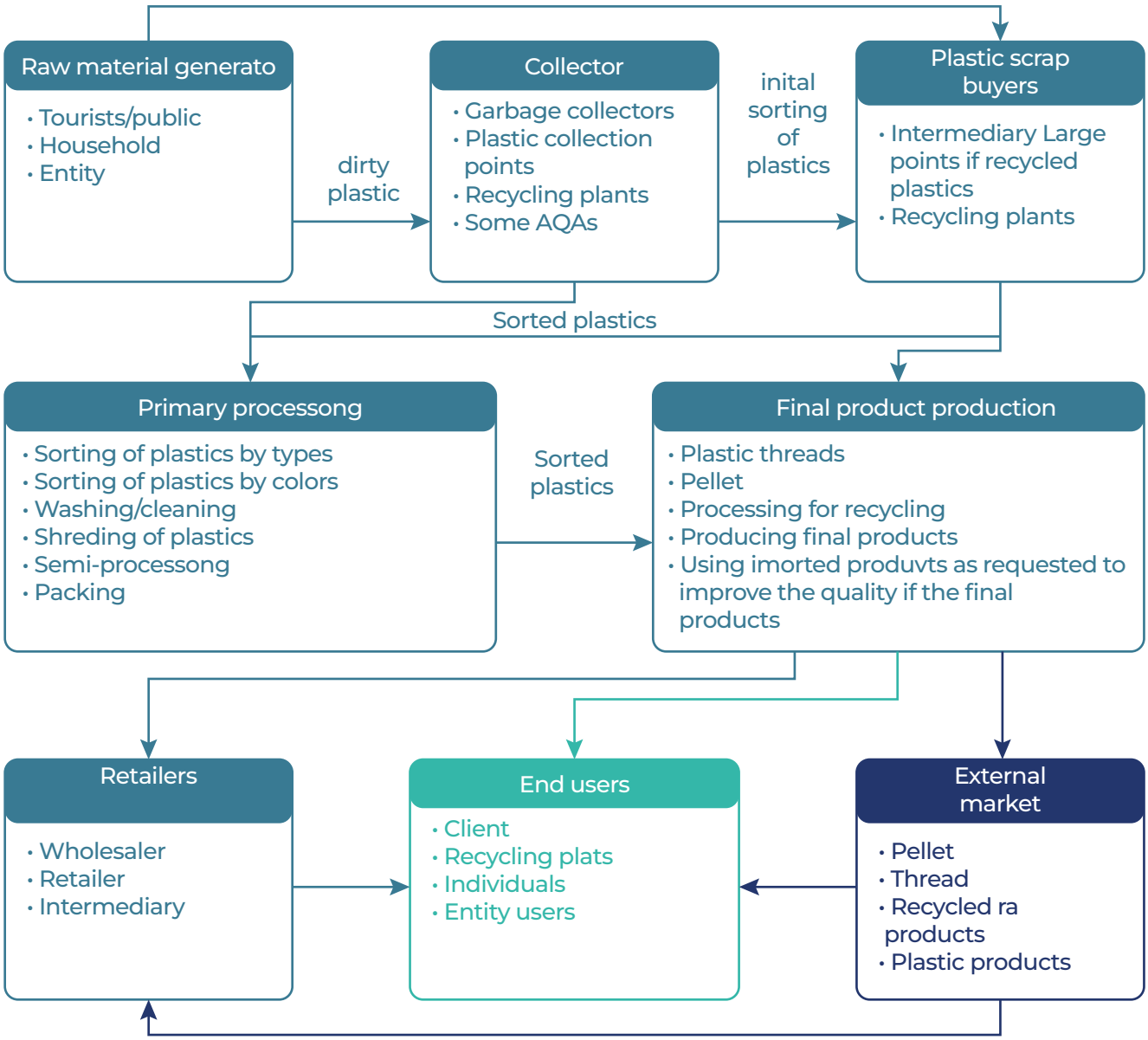
Note: *: in the column of quantity, the data that could be measured by tons are provided by the MCGA. Other measures such as square meters, square feet are not included here.*
Source of data: *MCGA*

As stated in the section above, the most common domestically made recycled product is a garbage bag. From the table, it can be seen that garbage bags are a product with a low import base value and a very small share of 0.001% of the total import of plastic products. On the other hand, the manufacturers surveyed planned to produce various types of pipes,

such as electric protection pipes, clean and dirt water pipes, and various plastic billets, to replace high-valued imported products, and products with high market capacity and demand. In addition, the table shows that the manufacturers plan to produce floors with corporate logos, without logos, various colors and shapes, such as bags and terraces for outdoor use and for indoor use such as parquet. It was common that manufacturers planned to produce shovels, shovels, chairs, garbage bags, etc., however the basic value of imports

3.7 | VALUE CHAIN MAPPING OF RECYCLED PLASTIC PRODUCTS

Image 2. *Overview of Plastic Value Chain in Mongolia*



is relatively low. The lower the base rate, the lower the contribution to manufacturer's sales revenue.

The value chain of recycled plastic in Mongolia has been developed based on the research conducted under the project and discussions with the managers from the MNRA.

RAW MATERIAL PREPARER: The main raw material of the recycling industry comes from plastic products generated by people (tourists), households and entities.

RAW MATERIAL COLLECTORS: This stage involves the activities of primary raw material

collectors, some AOAs and raw material recycling points while some manufacturers collect waste for their supply of raw materials. Most of the waste plastic comes from households and entities.

RAW MATERIAL BUYER: Here the raw materials are collected through recycling plants and large recycling centers. Buyers of raw materials supply primary and final products to manufacturers.

PRIMARY PROCESSING INDUSTRY: Primary processing plants collect recycled raw materials through raw material collectors or directly from the buyers and carry out semi-processing on the lines of plant technology.

FINAL PRODUCT PRODUCTION: Plastic products are purchased from raw material buyers and primary processing plants. The final product is produced using the recycled products and delivered to the market according to the lines of the technology. In very few cases, the final product made of plastic is exported to China. Also, at the request of the user, imported raw materials are used in the production to improve the quality of certain types of products.

TRADING ORGANIZATION: The final products are sold through wholesalers, retailers and intermediaries. Trading organizations also import similar products because the supply of domestically produced recycled plastic products cannot meet local demands. These distributors have a strong interest in selling locally produced products.

END USER: Finished recycled plastic products are purchased by clients, industries, citizens and entities. Mongolia produces more recycled plastic building materials than recycled plastic products for household use. End users also import the required plastic products because the local supply is limited.

FOREIGN MARKET: Some enterprises export their products abroad. For example, in 2020, Undur Akhiin Urguu LLC exported 2,500 tons of plastic (PET, HDPE, LDPE, PP) in the form of yarn to China. Now the factory is closed. Since 2021, export activities have been suspended due to customs restrictions and the increase in transportation prices..

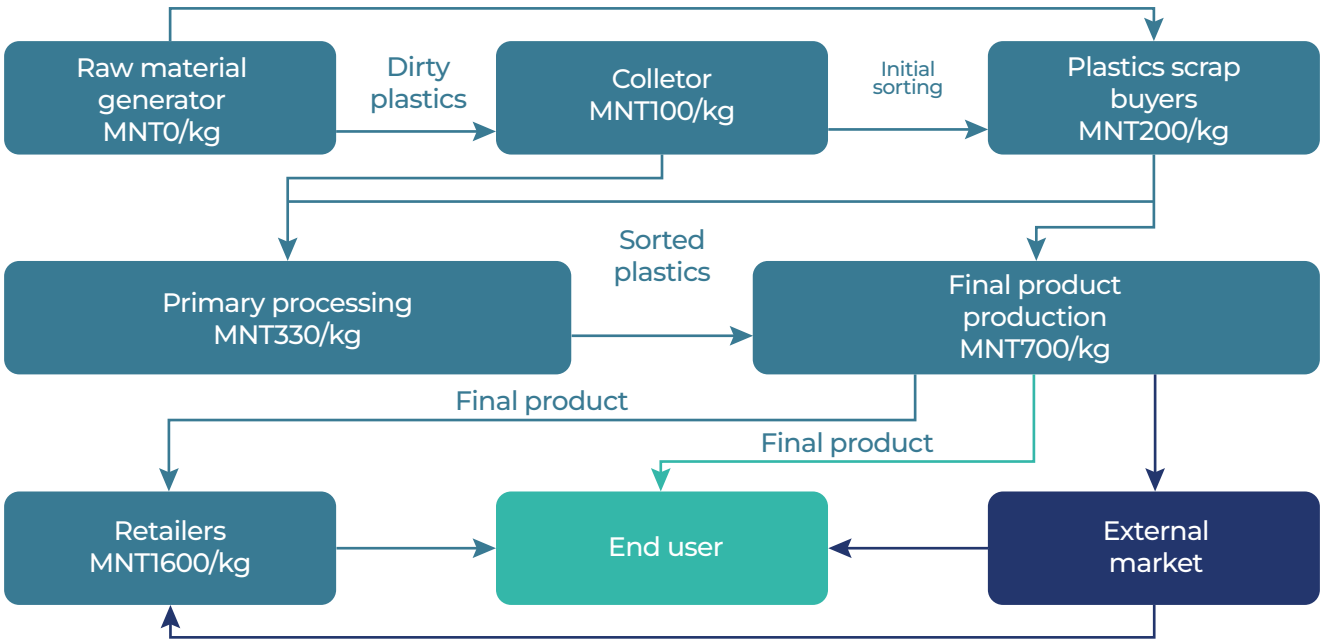
CALCULATION OF ADDED VALUE OF PET PLASTIC

The calculation of the added value of recycled plastic is done for the first time in Mongolia. The table below shows the intermediate use, added value, and price of the most common type of plastic waste, PET, from waste plastic to final product. The calculation was not analyzed in detail and was considered as a general overview, so it cannot be ruled out that there were errors.

In 2021, the study of recycling centers and recycling plants commissioned by the office of the Mayor of Ulaanbaatar was executed by the MNRA. According to the survey, 8.9 % of total waste (1.4 million tons) generated in Ulaanbaatar or 124 thousand tons of waste was supplied as recyclable raw materials to recycling centers and recycling plants. Of this, 8,600 tons were used only by PET plastic recycling plants. Of this, 60% (5,160 tons) of plastic waste was generated by entities, of which mining companies accounted for the largest share. About 30% (2580 tons) of PET recycled plastic comes from households, and 10% (860 tons) from citizens' and tourists' waste. In terms of raw material collectors, about 70% comes from recycling points, 15% from recycling plants, 10% from waste collectors, and 5% from AOA.

From Image 3, it can be seen that middlemen/trading organizations are the ones who get the most added value from the stage of plastic collection to final products and supply to the market. When calculating the total added value, the added value of the exported plastic products was not included, only the total added value when sold in the domestic market

Image 3. *Added value of one kilogram of PET plastic, 2021, by MNT*



was calculated. In this way, the total added value of one kilogram of PET in the value chain of recycled plastic products is MNT 2,930. 54.6% of this added value goes to intermediaries.

Calculated at each stage of added value, 1 kg of PET has MNT 100 for raw material collectors, MNT 200 for buyers, MNT 330 for primary processing plants, MNT 700 for final processing plants, and MNT 1600 for trading organizations. According to the estimation of the value chain of recycled plastics, the groups that benefit the most at the time of delivery to the end users are trading organizations, wholesalers, retailers and intermediaries. This pattern is also observed in other fields.

40 pieces of bottle blanks are produced from one kilogram of recycled PET, and if the price of one piece of blank is MNT 90, then one kilogram of tube blank is MNT3600.

SUB CONCLUSION:

- in line with global trends, the number of manufacturers and enterprises that recycle waste in Mongolia has been increasing in recent years. However, the majority of recycling points and recycling manufacturers are located in Ulaanbaatar. In particular, plastic recycling points are concentrated in Songinohairkhan and Bayanzurkh districts. This created the conditions for the duplication points operating in less concentrated locations to have a superior position in the market due to the difference in location.

- Recycling points mainly collect PET, HDPE and PE plastics and provide them to recycling plants. In 2021, they bought one kilogram of PET hard plastic for an average of MNT 191, one kilogram of HDPE soft plastic for an average of MNT 457 MNT, and one kilogram of PE plastic bag for an average of MNT 578.

- As of 2021, 18 of the 24 registered plastic recycling manufacturers in Ulaanbaatar were in a regular operation, earning an average annual sales revenue of MNT 19.2 billion. As of 2021, they used 52.4% of their capacity on average out of their total capacity to recycle 18,500 tons of plastic products per year.

- It is common for manufacturers to recycle HDPE, LDPE, and PE plastics and turn them into pellets and supply them to entity userss. The most common product supplied to household users is garbage bags. Based on the import data of the most commonly processed HDPE pellets, the domestic manufacturers have the market capacity to produce recycled pellets to replace imports by producing 4 times more than the current amount. There are enough market opportunity to expand production capacity of recycled plastic litter bags, various water pipes and shrinking wraps as the current production accounts for less than 0.5% of market supply.

- There is market capacity for expansion of production and production of finished products.

- Based on the years of operation, number of employees, total annual income, and production capacity of the surveyed factories, there are different scales of operations in the market. Factories do not fully utilize their current capacity and utilization levels remains insufficient. In the future, if these factories fully use their equipment and capacity, it is possible to increase the production of plastic products.

- 45% of the manufacturers do not use primary raw materials or virgin plastics, 55% uses virgin plastics and import mostly from China and South Korea.

- As of July 2022, factories are producing recycled plastic products such as: building materials, tools, tools, garbage bags, containers, boxes, tables and chairs, as well as making semi-finished pellets and raw materials such as PP, HDPE, LDPE. The study results show that they are satisfied with their own products, and rate the quality, color, and features of the competitors' products slightly lower than their own.

- Variables supporting the recycling industry here include: market demand, global trends, contributing to the creation of an environmentally friendly economic structure, abundant availability of raw materials, and production of products that replace imports at a cheaper price.

- Within the next five years, manufacturers plan to produce various types of pipes, including wide pipes for sewer wells, their fittings, house roofs, construction plastic panels, electrical pipe connectors, pipes with metal inside, rosette pipes, grass ropes, fence posts, shovels, and general purpose sacks.

- If the manufacturers improve their factory capacity and equipment, they will be able to produce new products, such as electrical protection pipes, pipes, nets with logos, plastic sewage pipes, drainage pipes, shovels, buckets, molds, animal watering tubs, plastic and wood shavings with special technology, terraced floors, exterior setkan cushioning, electric pipe connectors, iron pipes inside, switch socket cover, grass rope, clean and sewage pipe, utility bags, sacks, various other cables, plastic pipe accessories, ventilation pipes, deep wells, building panels, ladders, house plastic roofs, and fence posts.

- Plastic processing plants sell their products mostly to entity userss. Half of them supply their products to wholesalers, and 27.8% sell their products to household users (four products are supplied: chairs, pit toilet lids, packaging bags, and sewer pipes). There are very few manufacturers that supply directly to government agencies or export.

- Although the recycling plants are all located in Ulaanbaatar, they sell their products outside of Ulaanbaatar. Most manufacturers sell directly from their factory premises. Almost all of them have cooperation agreements with their users to buy their products in bulk and directly. Half of the producers sell through contracted distributors, while one third go to the market to sell their products. They don't usually use sales channels such as chain stores, supermarkets, "8" retail package stores, mini markets, or online shops.

- When setting the price of their products, manufacturers mostly adhere to the principle of basing on the cost of the product, taking into account the prices set by the domestic manufacturers and the imported manufacturers of the same type of products. When producing the product with an order, the price is agreed with the client.

- Manufacturers focus on product quality, health, safety, availability, continuous supply, variety of products, and low prices. They do not use any promotional marketing methods or tools to increase sales. In order to increase their sales they need to: increase their equipment and production capacity; ensure the quality of raw materials and a stable supply of raw materials; improve the feature and design of products; and garner government support for the production of recycled products.

- 88.9% of the manufacturers believe that their products can replace the same imported products and compete with imported products. However, 55% of entity users believe recycled plastic products are not competitive with imported products. The remaining 17% said they do not know. In addition, the study results show that knowledge and understanding of plastic product importers and distributors is poor regarding the capacity and resources among the manufacturers. Manufacturers need to promote and inform the public, retailers, and distributors of their products about the quality and competitiveness of their recycled products.

- Analyzing the import situation of plastic products entering our country, as of 2019 China, South Korea, Russia, USA, Australia, Germany, Italy, Japan, Switzerland, and Malaysia supplied 90.1% of the total import of plastic products. China alone accounted for 65.8% of total plastic imports.

- As of 2019, 3601 enterprises, organizations, and individuals imported plastic products. The first 10 enterprises accounted for one fourth of the total imports. They mostly imported goods and materials such as water and beverage bottle blanks, raw materials, stoppers, labels, seals, polyethylene terephthalate, and plastic film.

- In 2019, 7,000 types of plastic goods and materials were imported into Mongolia. The 15 imported products with the highest value make up approximately three fourths of the total import base value. These consisted of polystyrene, polyethylene, polymers, polyacrylamide, panels, various building materials, billets, pipes, plugs, films, labels, industrial inputs, household products such as bags, linoleum, containers and porlon.

- Of the participants sampled in the PET value chain, value-added intermediaries accounted for the largest share of profits.

04 STUDY ON PLASTIC PRODUCT DEMANDS

In this section, the use, attitudes, knowledge and understanding of household and institutional users of plastic products are summarized. The analysis of the existing situation of use is outlined.

4.1 | USE AND BEHAVIOR OF HOUSEHOLD USERS OF THE PLASTIC PRODUCTS

4.1.1 | GENERIC DEMOGRAPHIC INFORMATION OF THE RESPONDENTS

A total of 393 randomly selected users were surveyed, including 343 users from nine districts of Ulaanbaatar and 50 users from Khutag-Ondur Sum of Bulgan province. Eight of these households were excluded from the study because they did not use plastic products. Therefore, the data of the remaining 385 households were used for the analysis. Data collection (semi-structured interviews) was conducted through telephone.
The generic demographic information of the respondents is analyzed based on age, gender, employment status, and educational attainment. 34% of the respondents were men and 66% women. In terms of age, 63% of them were between 18-44 years old, and the remaining 37% were over 45 years old.

Figure 18. *By gender, %*

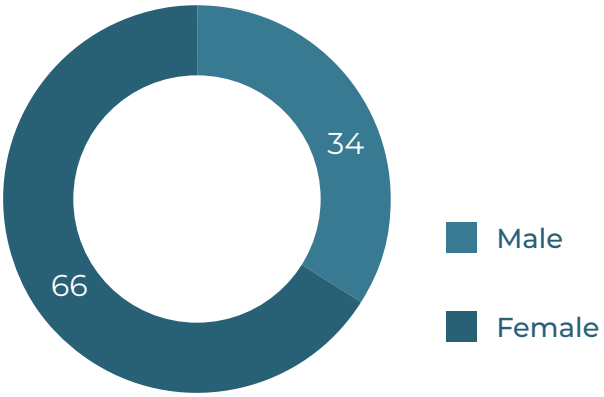
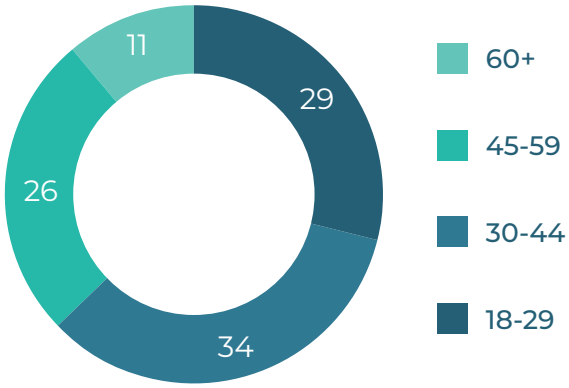
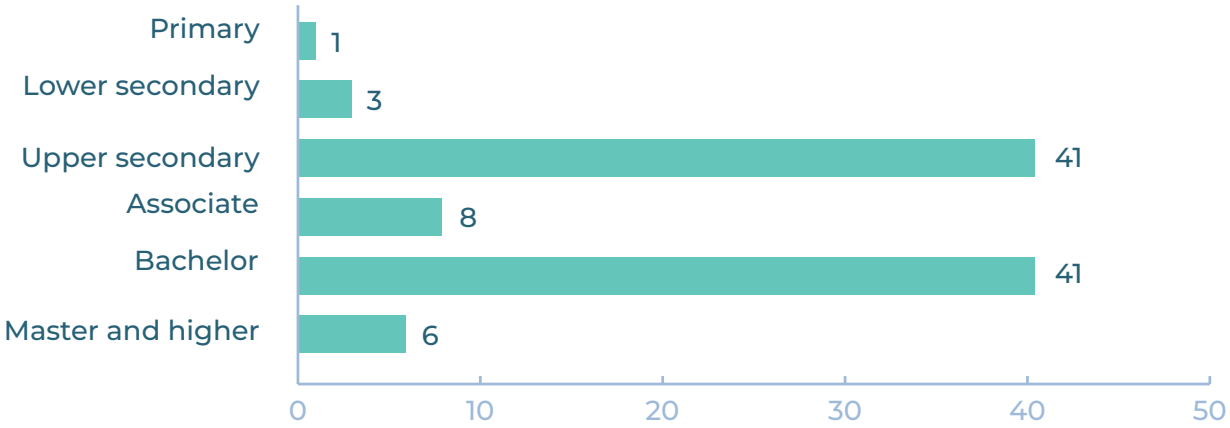


Figure 19. *By age groups, %*



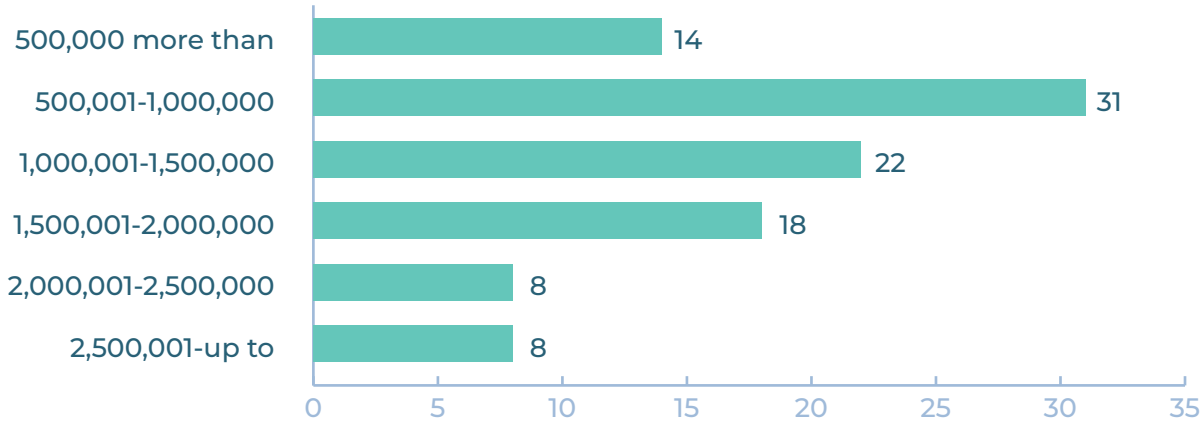
In terms of educational attainment, 47% of the respondents had higher education and 41% had upper secondary education.

Figure 20. *Educational attainment, %*



In terms of average monthly household income, 14% of the respondents had monthly income up to MNT 500,000, 53% earned MNT 500,001-1,500,000 per month, and 46% earned more than MNT 1,500,000. According to the NSO, in the first quarter of 2022, the national average net monthly income of a household was MNNT 1.2 million. The average monthly household income of the respondents was close to the national average.

Figure 21. *Monthly household income, MNT %*

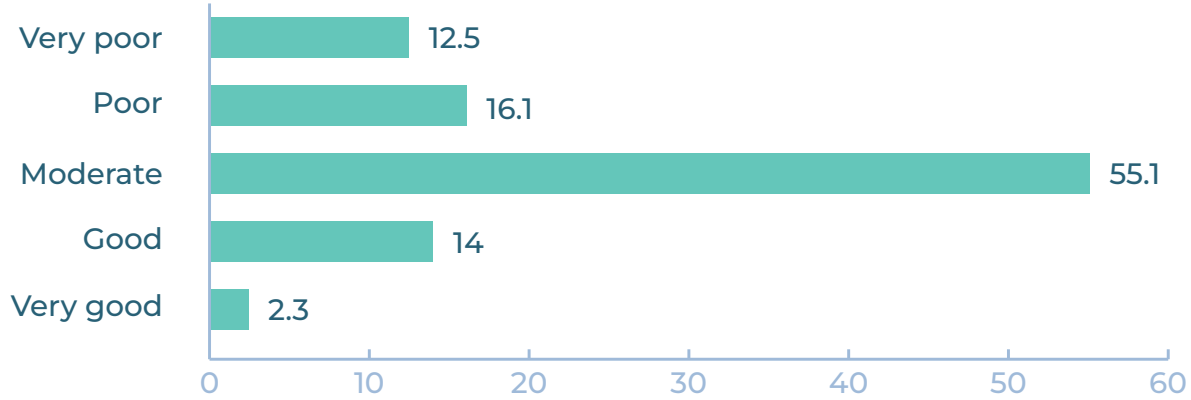


Based on previous waste studies, we hypothesized that the use of plastic products is different depending on the living environment and location of users. Therefore, respondents were classified according to their location, with 41% of households living in apartments, 56% in ger areas, and 3% living in camps.

4.1.2 | PERCEPTIONS AND ATTITUDES TOWARDS PLASTIC PRODUCTS

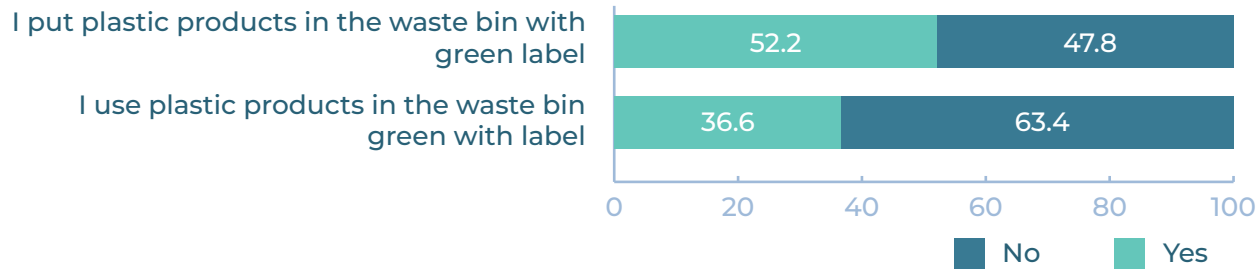
When asking the knowledge of household users about plastic products, 16.3% of all respondents had “good” and “very good knowledge”, 55.1% had “moderate” knowledge, and the remaining 28.6% had “below average or no knowledge”

Figure 22. *Respondents’ knowledge of the recycled plastic products, %*



There is no significant difference in response to this question based on location, gender, and age of the respondents.

Figure 23. *Respondents’ practice of reusing and sorting of the plastic products, %*



64% of young people with 18-29 age sorts waste while only 43% of people with 60 age. In Bulgan, people reuse less often but sorts waste more often than people in Ulaanbaatar. People living in summer houses or apartments are more likely to sortwaste compared to people in the get areas.

Table 15. *Respondents' knowledge of the recycled plastic products, %*

		Very good	Good	Moderate	Poor	Don't know
Type of accommodation	Apartment	3.8%	15.8%	57.6%	14.6%	8.2%
	Ger areas	0.9%	3.1%	52.3%	17.8%	15.9%
	Camp	7.7%	7.7%	69.2%	7.7%	7.7%
Location	Ulaanbaatar	2.7%	14%	54.9%	16.1%	12.2%
	Bulgan aimag	0.0%	14%	56%	16%	14%
Gender	Male	1.5%	11.5%	57.7%	17.7%	11.5%
	Female	2.7%	15.3%	53.7%	15.3%	12.9%
Age group	18-29	3.6%	12.6%	57.7%	18.9%	7.2%
	30-44	0.8%	19.1%	51.1%	16.8%	12.2%
	45-59	2%	12.1%	55.6%	14.1%	16.2%
	60+	4.5%	6.8%	59.1%	11.4%	18.2%

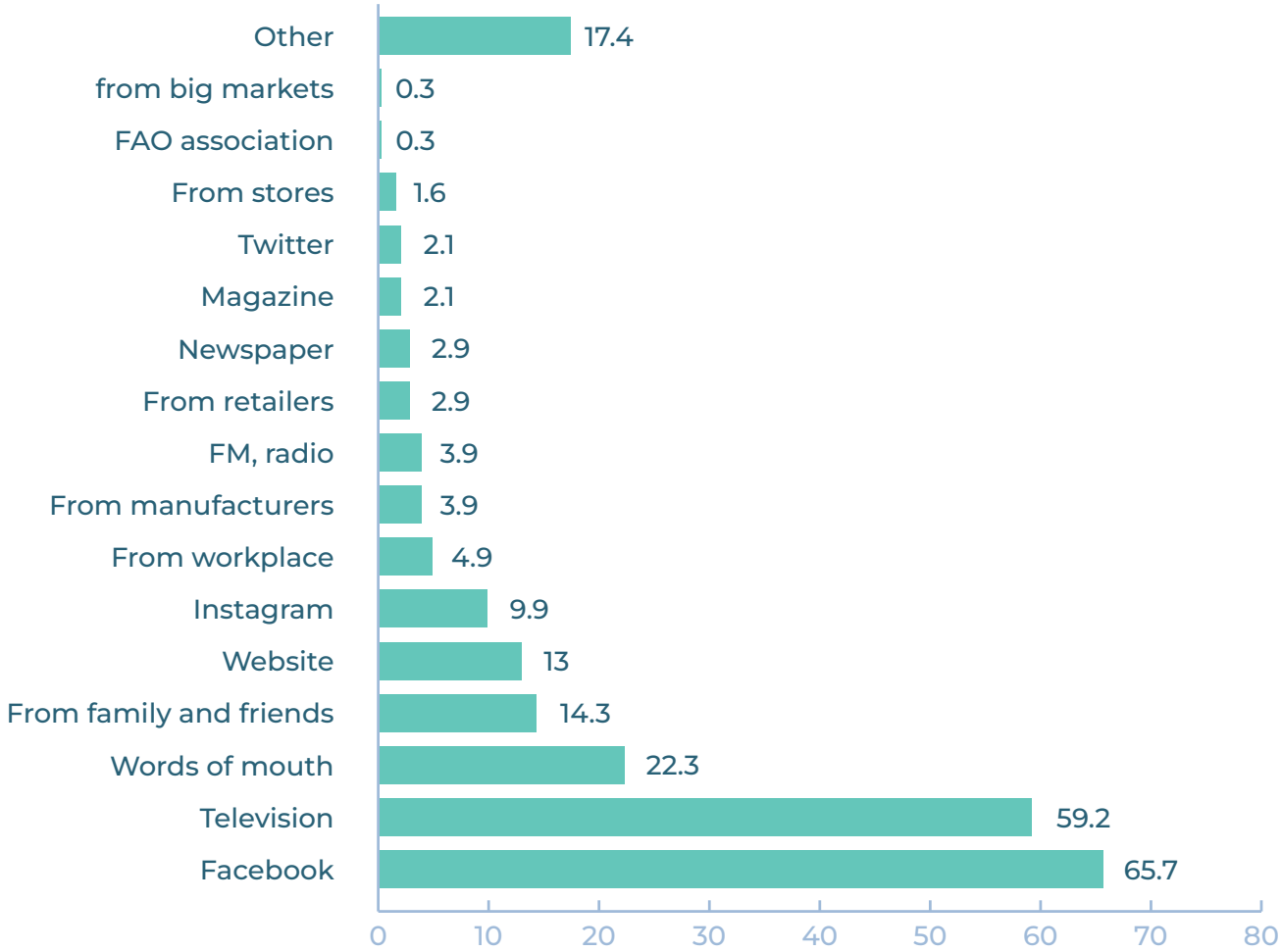
36.6% of all household users reuse plastic products, while 52.2% sorts plastic waste.

Table 16. *Whether plastic waste is reused and sorted or not, %*

Items		% of the respondents who reuse plastic products more than once		% of the respondents who put plastic products in the waste bin with green label	
		Yes	No	Yes	No
Types of accommodation	Apartment	40.5%	59.5%	62%	38%
	Ger areas	34.1%	65.9%	44.4%	55.6%
	Summer house	30.8%	69.2%	61.5%	38.5%
Location	Ulaanbaatar	38.5%	61.5%	51.6%	48.4%
	Bulgan aimag	24%	76%	56%	44%
Gender	Male	40%	60%	60.8%	39.2%
	Female	34.9%	65.1%	47.8%	52.2%
Age group	18-29	40.5%	59.5%	64%	36%
	30-44	38.2%	61.8%	50.4%	49.6%
	45-59	34.3%	65.7%	45.5%	54.5%
	60+	27.3%	72.7%	43.2%	56.8%

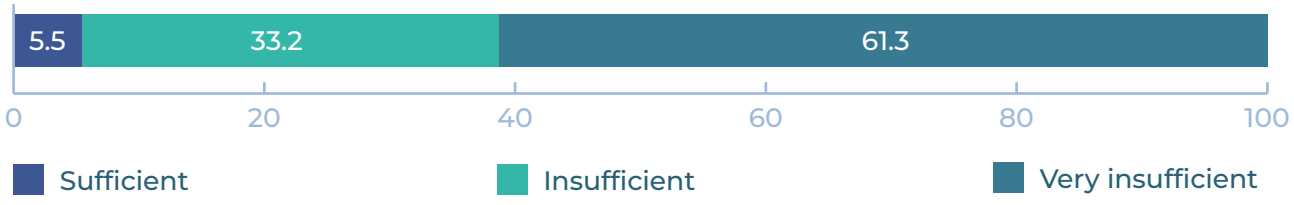
In terms of source of the information, 65.7% of the respondents got information about plastic products from Facebook, 59.2% from television, 22.3% from word of mouth, 14.3% from family and friends, and 13% from news websites. Compared to the results of the other research, it is observed that respondents get information about other social issues from official channels such as television, newspapers, and websites, while they get information about recycling and sorting plastic waste from Facebook.

Figure 24. *Information channel of the recycled plastic products, %*



When asked whether there was enough information about recycled plastic products produced in Mongolia, 5.5% of the respondents said that they had enough information, 33.2% had moderate information, and 61.3% had very insufficient. This suggests the respondents had little knowledge and information about recycled plastic products in Mongolia.

Figure 25. *Respondents' knowledge and information of the recycled plastic products in Mongolia ,%*



4.1.3 | PERCEPTIONS AND USE OF PLASTIC PRODUCTS BY HOUSEHOLDS

Table 17. *Respondents' household consumption of the plastic products, %*

№	Item	Consumption, HH %	Yearly consumption in unit	Location		
				Apartment	Ger areas	Camp
1	Garbage bag	92.5%	404	39.7%	49.9%	2.9%
2	Mesh and plastic bags	86.2%	282	36.1%	47.3%	2.9%
3	Household plastic pots	82.3%	5.3	33.8%	45.5%	3.1%
4	Water tank /canister/	67.8%	11.4	14.5%	50.6%	2.6%
5	Plastic chairs	64.2%	5.2	24.9%	37.7%	1.6%
6	Plant pots	50.9%	7.8	25.7%	23.6%	1.6%
7	Plastic food container	47%	7	19.5%	25.7%	1.8%
8	Plastic toys and souvenirs	44.2%	28	18.4%	23.6%	0.5%
9	Plastic cups	20.8%	9	9.1%	10.9%	0.8%
10	Plastic spoon and fork	11.9%	12.8	5.2%	6.2%	0.5%
11	Other	13.8%	8.6	5.7%	7.3%	0.8%

Looking at the consumption of plastic products in household use, the use of garbage bags, plastic bags, household plastic bottles, plastic water bottles, plastic chairs, and flower pots was relatively high.

Table 18. *Market opportunities for plastic products, number*

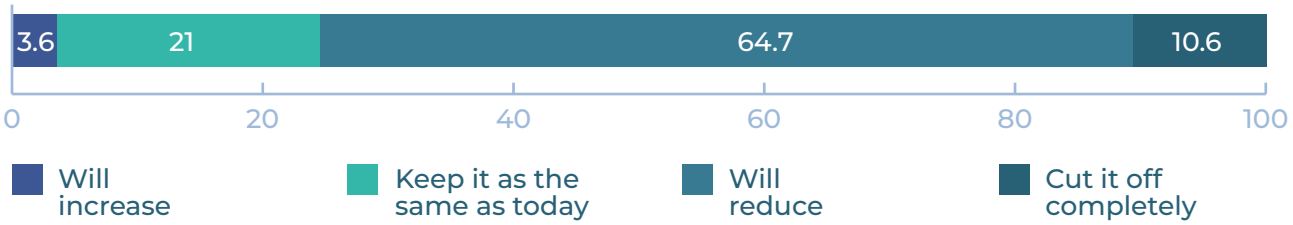
Type	HH, %	Yearly consumption of plastic in unit per HH	No. of HH	Quantity of the plastics used yearly	Unit price[12]	MNT
Garbage bag	92.5%	373	381,587	142,332,128	100	14,233,212,818
Mesh and plastic bags	86.20%	282	355,598	100,278,713	150	15,041,806,990
Household plastic pots	82.30%	5.3	339,510	1,799,402	2,500	4,498,503,803
Water bottle/Canister/	67.80%	2	279,693	559,387	20,000	11,187,732,240
Plastic chair	64.20%	5.2	264,842	1,377,180	15,000	20,657,702,052
Plant pot	50.90%	7.8	209,976	1,637,815	3,500	5,732,351,434
Plastic food pot	47.00%	7	193,888	1,357,214	350	475,024,841
Plastic toys and souvenirs	44.20%	28	182,337	5,105,434	4,500	22,974,453,684
Plastic cup	20.80%	9	85,806	772,251	100	77,225,054
Plastic spoon and fork	11.90%	12.8	49,091	628,361	80	50,268,890
Other	13.80%	8.6	56,929	489,587	-	-

[11] Use the existing market price

98% of all respondents use plastic products in some way, while 2% do not use plastic products at all. As of 2021, there are 412,527 households in Ulaanbaatar, of which 92.5% or 381,587 households use garbage bags. ssuming that one household uses an average of 373 bags per year, 142,332,128 garbage bags are used in Ulaanbaatar. If the amount of consumption is calculated by the average price of MNT 100 for a garbage bag, the total sales amount is MNT 14,233,212,818.

Ирээдүйд хуванцар бүтээгдэхүүний хэрэглээгээ өөрчлөх эсэхийг тодруулахад 3.6% нь хэрэглээгээ нэмэгдүүлнэ, 21% хэвэндээ, 64.7% хэрэглээгээ багасгана, 10.6% огт хэрэглэхгүй гэж хариулсан.
Asked the reasons of planning to reduce the use of the plastic products in the future, 3.8% said it is expensive, 3.1% said there is limited variety, 0.3% said there are poor product

Figure 26. *Whether the respondents' will change their consumption of plastic products, %*



features, 1.4% said there is low availability, 16.6% disliked the smell, 25.9% were not satisfied with the quality and durability, and 1% believed there were poor color choices. Of the respondents that said they would reduce the use of plastic products in the future, 28.3% were motivated because plastic products are non-organic, 50.3% were motivated by the negative environmental impact of plastic and 84.1% were most concerned with the health impacts of plastic use.

Looking at the origins of the plastic products mostly purchased by consumers, 60.5% were from China, 28.1% were from South Korea, 11.7% were from Russia, Mongolia (6.2%), 6%

Figure 27. *Consumers' tendency to buy plastics based on origin, %*

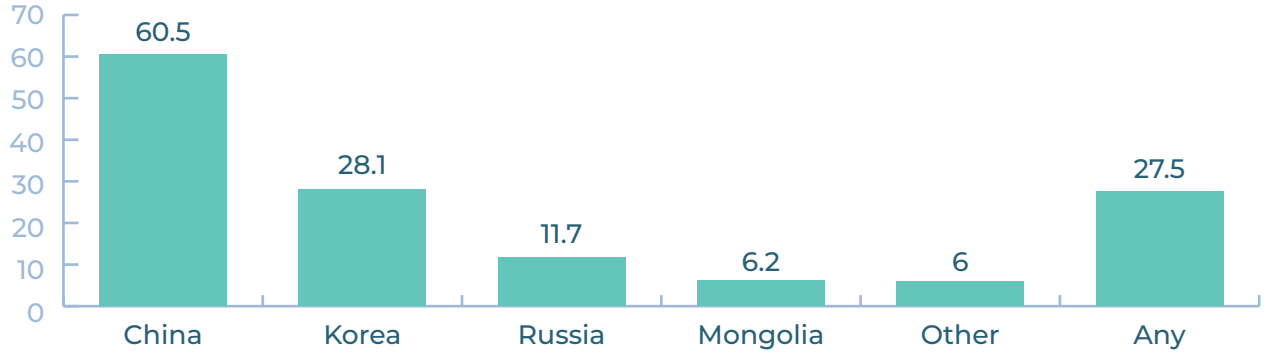
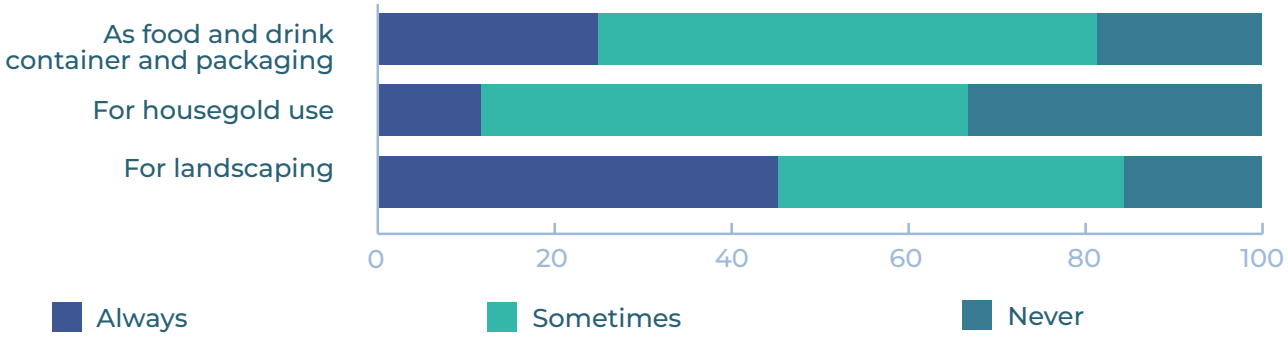


Figure 28. *Uses of plastic products with purposes, %*



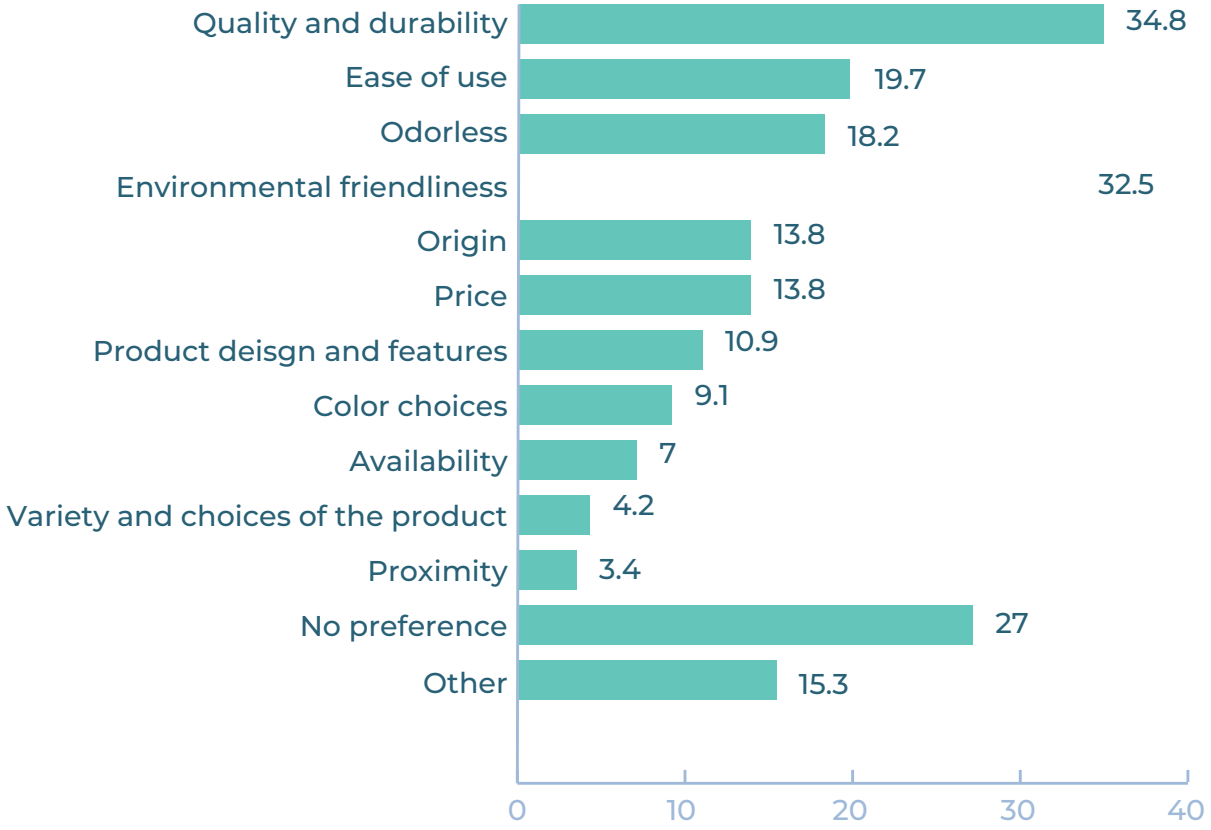
were from other countries, and 27.5% does not know the origin. This suggests that it is not important where plastic products are originated from.

When asked where the respondents mostly use plastic products, 48.6% said they use them at home, 42.3% use them when traveling, 15.1% use them at their workplace, 26% use them when getting services, and 6.5% use them in other situations.

Figure 29. *Places where the plastic products are the most in use, %*

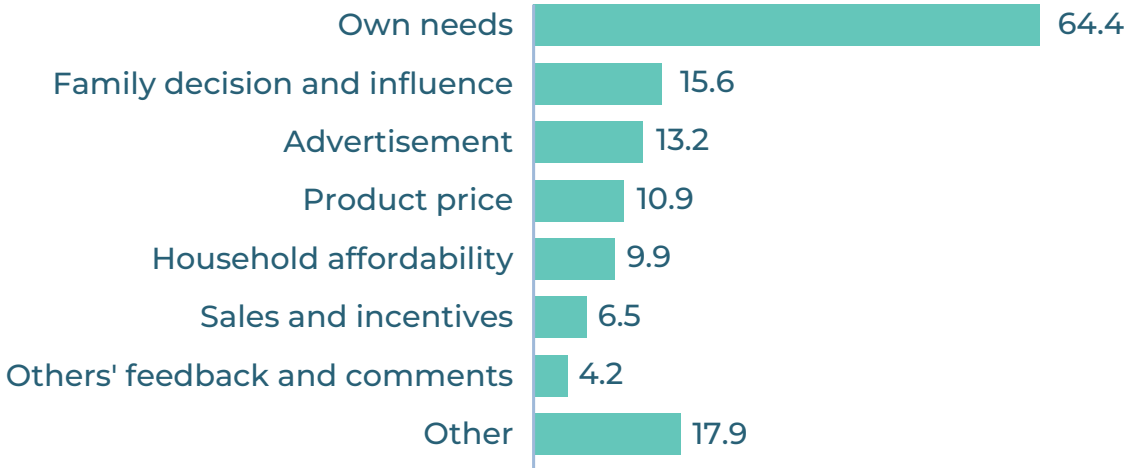
For household users, when purchasing plastic products, they gave importance to quality, durability, ease of use, odor, perceptions as a natural product, and environmental friendliness.

Figure 30. *Respondents' preference to use of the plastic products, %*



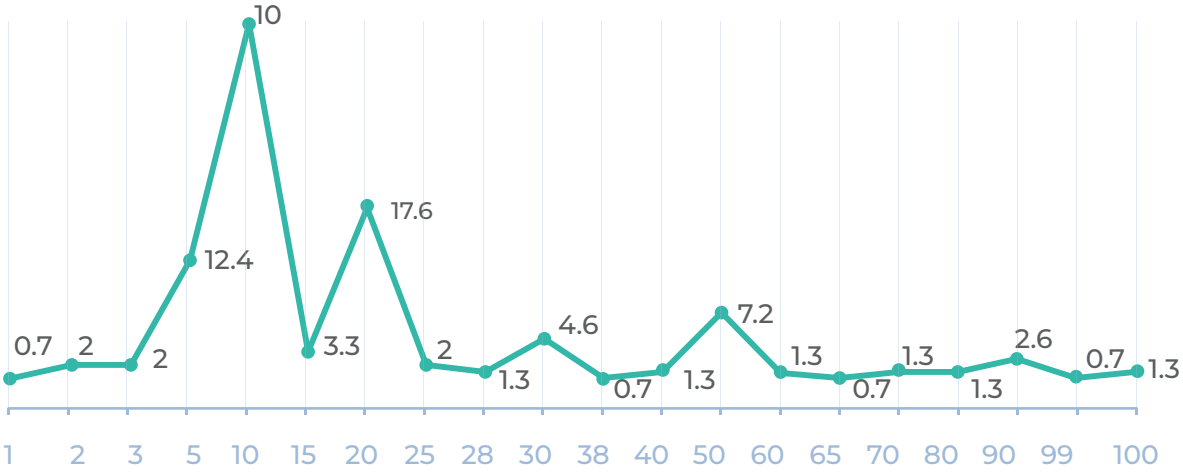
When clarifying the factors that influence the decision to purchase plastic products, 64.4% of the respondents made purchases based on their own needs, 15.6% made purchases based on the decision of family members, 13.2% made purchases based on advertisement, 10.9% made purchases based on product price, and 9.9% made purchases based on household affordability.

Figure 31. *Factors that influence the decision to buy plastic products, %*



42.1% of the respondents said that they would buy recycled plastic products produced in Mongolia if they were sold at a higher price than products made from the same type of imported primary raw materials. When asked what percentage of difference extra they would pay for a domestically made product, they said they would pay an extra 22.4% on average, with a minimum of 1% and maximum of 100%.

Figure 32. *Willingness to buy the products with value-added price, %*



When asked what kind of raw material they prefer when using plastic products, 34.3% said primary raw material, 7.8% said secondary raw material, 5.7% said mixed, 28.8% said they do not mind, and 23.4% did not know (23.4%).

Figure 33. *What composition of the plastic products the respondents would prefer*

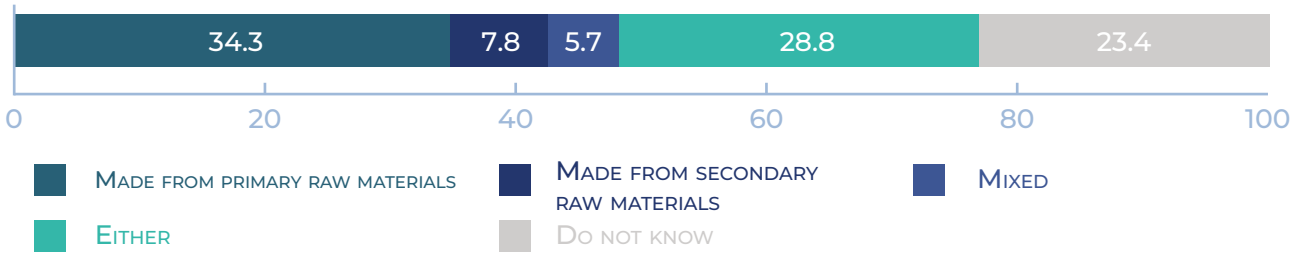
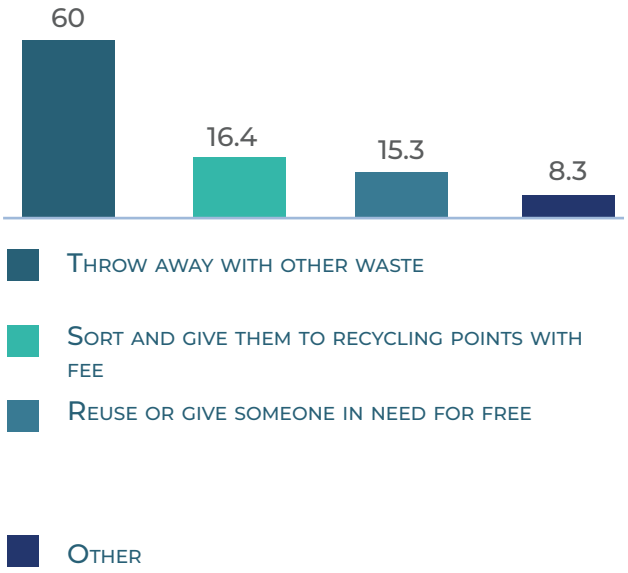


Figure 34. *What the respondents do with plastic products once they use, %*

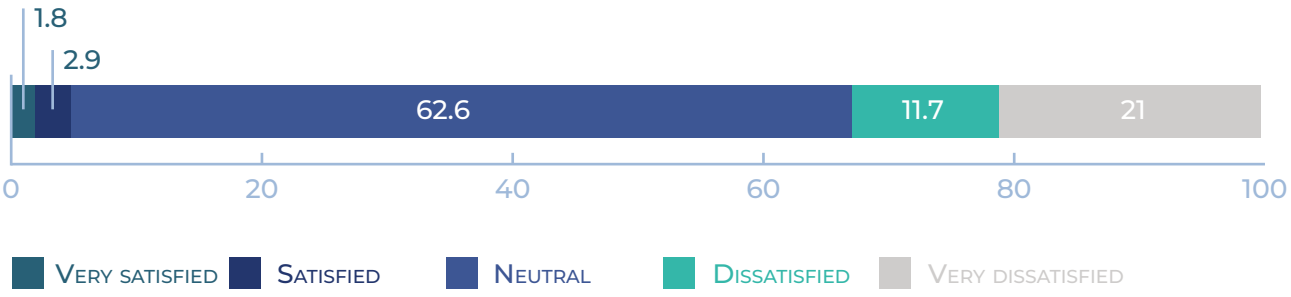


After household users finish using plastic products and packaging, 60% throw them directly into the trash together with other waste, 16.4% sort it in the bins at work and home and send them to recycling centers with incentives, 15.3% reuse or give to others for free and 8.3% replied they do something else outside the categories above.

When asked how satisfied household users were with using plastic products, 4.7% of the respondents are "very satisfied and satisfied," 62.6% said they were "neutral," and 32.7% were "dissatisfied."

66.2% of the respondents said they would be interested in buying domestically made plastic products. The plastic products need

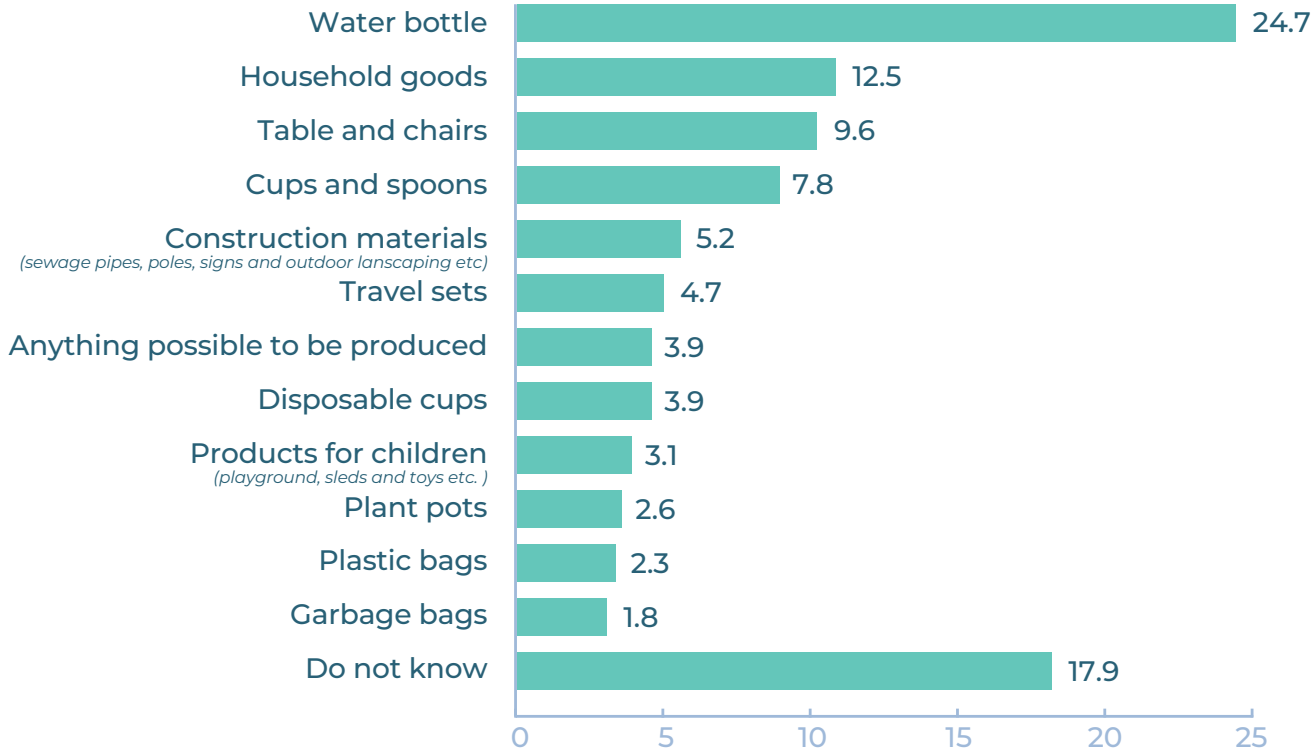
Figure 35. *Respondents' satisfaction with the plastic products, %*



improvement in their quality, design, and product range, price options, ingredients, and promotions.

Figure 36. *Needs of the improvement in the plastic products, %*

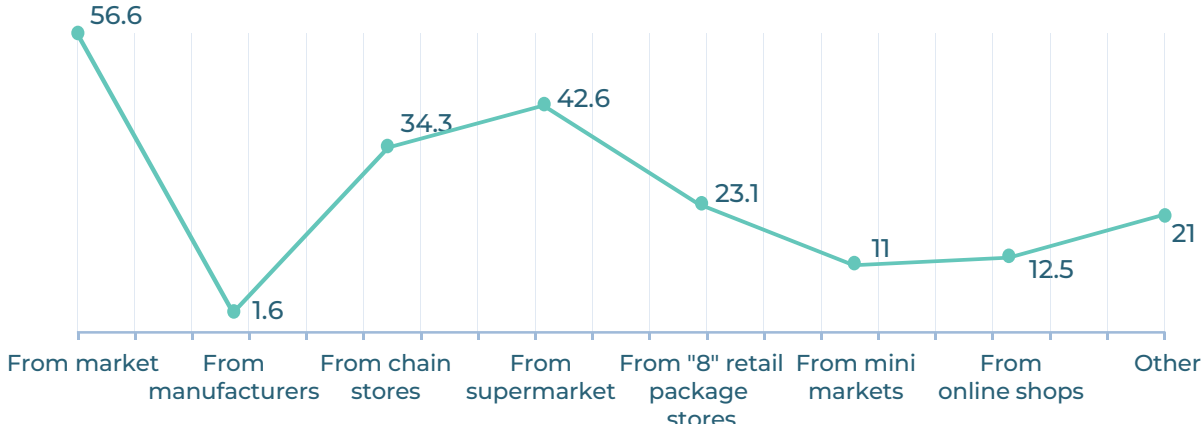
Figure 37. *Interest in buying domestically made plastic products, %*



When asked what types of the domestically made plastic products the respondents would be interested in buying, they want the most commonly used household plastic products to be replaced with domestically produced plastic products. This included water bottles, household goods, tables, and chairs.

56.6% of household users bought plastic products from markets, 1.6% bought from

Figure 38. *Where the respondents usually buy plastic products, %*



manufactures, 34.3% bought from chain stores, 42.6% bought from supermarkets, 23.1% bought from “8” retail package store, 14% bought from mini markets, 12.5% bought from online shops, and 21% bought from other sales channels.

For household users, plastic products are widely used in various forms of food products, household products and public infrastructure. Quality, color, design and price were prioritized by users and informed their purchase choice. The fact that plastic products are sold at markets, chain stores, and supermarkets suggest the wide use of plastic products for consumer purposes.

4.2 | ENTITY USERS' USE OF AND BEHAVIOR WITH PLASTIC PRODUCTS

The section of the report outlines the results of the entity users of plastic products in terms of their consumption and future trends. The entity survey covered a total of 21 well-known entities operating in the wholesale and retail trade, construction, hotel, catering services, and processing industries .

Managers, executive, and decision-making level officers from the entities were interviewed. Looking at the years of operation, they had been in operation for 13 years on average, with a minimum 3 years and maximum 30 years. They had a minimum of 4 employees and a maximum of 2,000 employees, with an average of 211.

4.2.1 | PERCEPTIONS AND ATTITUDE TOWARD RECYCLED PLASTIC PRODUCTS

The use of plastic products was high for the surveyed entities. Depending on the field of operation, the entities use a maximum of 6 types of plastic products in their operations regularly. These include:

- For Central Express, CVS /CU/, Shulunduu LLC, and Eruulmaa LLC representing the wholesale and retail trade and catering industry, the most commonly used plastic products were disposable packaging bags, containers, packaging, gloves, garbage bags, disposable food containers, single use spoons, forks, plastic coffee lids, garbage bags, food tape, and food gloves.

- For construction companies: fresh water pipes (PPR), sewage water pipes (PVC), heating pipes (PVC), insulation protection for plastic pipes, vacuum window frames, plastic molds for concrete structure, electric protection conduits, window frames, handles, seals, and rubber were mainly used.

The entities tended to import plastic products from wholesale centers. Only 20% of the entities buy domestically made plastic products while 80% imported plastic products. When asked about their plan for their supply, 33% said they would buy domestically produced products, 38% said imported products, and 29% said either.

- **THE REASONS FOR BEING INTERESTED IN DOMESTICALLY PRODUCED PRODUCTS:** There is a high interest in supporting domestic production. However, they highlighted they have little knowledge and information of the products and services of the domestic manufacturers. They reported that the quality cannot meet standards and prices are not competitive with the imported products. It is believed among the entities that choosing domestically made products will mean less exposure to the border closures..

- **THE REASONS FOR BEING INTERESTED IN IMPORTED PRODUCTS:** The main motives for choosing imported products were the quality and standards of disposable packaging for food products, variety of products, and improving competitiveness in the market by using branded products. They also emphasized that the domestic production cannot fully supply the market needs because of its limited production.

- **THE REASONS FOR NOT GIVING AN IMPORTANCE ON THE ORIGIN OF THE PLASTIC PRODUCTS:** These entities gave a lot of importance on the quality of products. As long as the product quality is high, they buy either product. They said that it is common that the price of the domestically made plastic products are not competitive with the imported ones.

[12] Central Express /CU/, Shulunduu LLC, Eruulmaa LLC, Teso LLC, All Engineering Service LLC, B&B Construction, Green Resource Construction LLC, Badrakh Urguu Development LLC, LCB LLC, Khutul Telmen Construction LLC, Khurd Group LLC, Khet Khuleg LLC, Bagana Urguu LLC, Ulziitiin Khiimore Uuduu LLC, Munkh Ezlen LLC, Munkh Khur LLC, Ovoo Khiits LLC, Khiirev LLC, Oim Nogoon LLC, Selbe Plaza LLC, Sentii Hotel LLC

Table 19. *Supply of the plastic products, %*

№	Name of the entity	From manufa cturer	From wholesale centers (domestic products)	From wholesale centers (imported products)	Manage border trad themselves
1	Central Express CVS /CU/		10%	80%	10%
2	Shulunduu LLC		10%		90%
3	Eruulmaa LLC		5%		95%
4	Teso LLC	30%			70%
5	All Engineering Service LLC			100%	
6	B&B Construction				100%
7	Green Resource Construction LLC			100%	
8	Badrakh Urguu Development LLC			50%	50%
9	LCB LLC		50%	50%	
10	Khutul Telmen Construction LLC			100%	
11	Khurd Group LLC	Subcontractors			
12	Khet Khuleg LLC			100%	
13	Baganat Urguu LLC	10%			90%
14	Ulziitiin Khiimori Uuduu LLC			100%	
15	Munkh Ezlen LLC			80%	20%
16	Munkh Khur LLC	10%		90%	
17	Ovoo Khiits LLC			100%	
18	Khiirev LLC	100%			
19	Oim Nogoon Urlan LLC			20-13%	80-87%
20	Selbe Plaza LLC	20%		80%	
21	Sentii Hotel LLC	20%		80%	

№	Name of the entity	From manufa cturer	From wholesale centers (domestic products)	From wholesale centers (imported products)	Manage border trad themselves
14	Ulziitiin Khiimori Uuduu LLC			100%	
15	Munkh Ezlen LLC			80%	20%
16	Munkh Khur LLC	10%		90%	
17	Ovoo Khiits LLC			100%	
18	Khiirev LLC	100%			
19	Oim Nogoon Urlan LLC			20-13%	80-87%
20	Selbe Plaza LLC	20%		80%	
21	Sentii Hotel LLC	20%		80%	

For entity users, the critical issues influencing their import choices included border customs, transportation logistics, exchange rate differences, and customs taxes hindering their operations. The issues impacting domestically produced products choices include quality, standard requirements, and supply.

Table 20. *Strengths and weaknesses of the products used by the entity users*

№	Name of the entity	From manufa cturer	From wholesale centers (domestic products)	From wholesale centers (imported products)	Manage border trad themselves
1	Central Express CVS /CU/		10%	80%	10%
2	Shulunduu LLC		10%		90%
3	Eruulmaa LLC		5%		95%
4	Teso LLC	30%			70%
5	All Engineering Service LLC			100%	
6	B&B Construction				100%
7	Green Resource Construction LLC			100%	
8	Badrakh Urguu Development LLC			50%	50%
9	LCB LLC		50%	50%	
10	Khutul Telmen Construction LLC			100%	
11	Khurd Group LLC	Subcontractors			
12	Khet Khuleg LLC			100%	
13	Baganat Urguu LLC	10%			90%

14	Ulziitiin Khiimori Uuduu LLC			100%	
15	Munkh Ezlen LLC			80%	20%
16	Munkh Khur LLC	10%		90%	
17	Ovoo Khiits LLC			100%	
18	Khiirev LLC	100%			
19	Oim Nogoon Urlan LLC			20-13%	80-87%
20	Selbe Plaza LLC	20%		80%	
21	Sentii Hotel LLC	20%		80%	

The entity users regarded that the existing plastic products in demand can be produced in Mongolia, replacing the imported products.

Table 21. *A list of products potential of substituting the import products, which are used by the entities %*

Source	Strengths	Weaknesses
Imported	• Quality and in compliance with the standards • The imported container does not spill when carrying liquid food • Cooperate with internationally well-known factories • There is little doubt of the quality of the product when using international quality products	• Border closure issues • Shipping cost • Exchange rate difference • Customs duties
Domestic	• When using vacuum window blanks of the domestic manufacturers, they are reasonably priced • Time-saving	• It is not clear if the domestically made products meet the standards • They are smelly • The products cannot meet the quality standards, which results in loss of time and money • Discoloration happen • Inadequate supply and frequent shortages of sewage pipes

When asked whether the entities had cooperation agreements with domestic plastic recycling factories, 17.6% (3) had a cooperation agreement. These 3 organizations operated in the construction and catering industry. It is emphasized that the advantage of having a cooperation agreement is that both parties took mutual responsibility, fulfilled their commitments on time, and ordered their necessary products in the required models and quantities.

This system increased the quality of products and made it possible to order products by transferring advance payments..

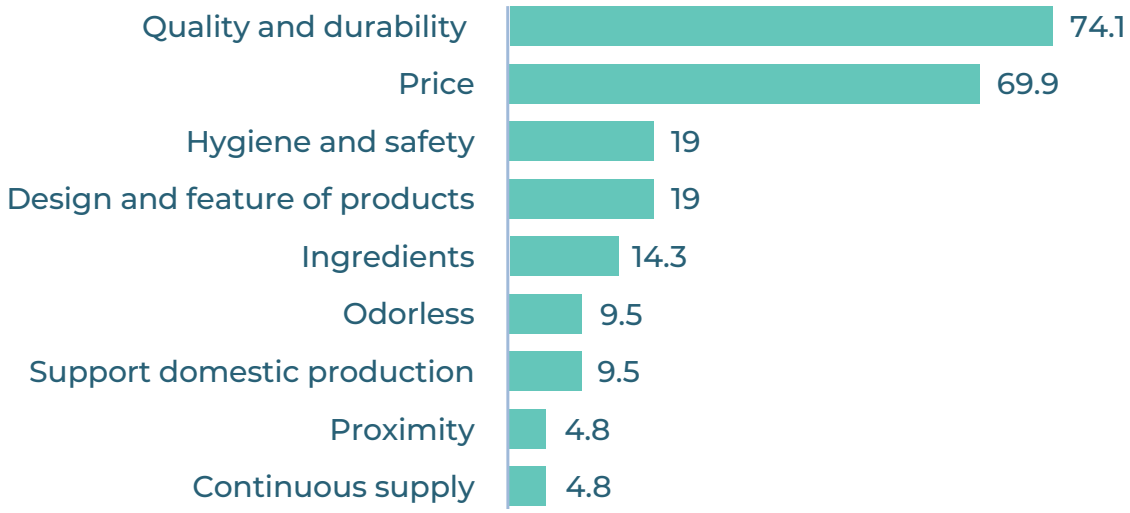
When asked whether domestic manufacturers provided incentives or discounts for purchasing plastic products, 16.7% (3) of them received incentives and discounts. They include (i) negotiating payment terms, bartering, and prices, (ii) adding the necessary clauses in the terms of the contract, (iii) the opportunity to order and receive products by transferring a small advance payment. The following are the most desired incentives:

- offering discounts and incentives for bulk purchases,
- offering non-inflated, uninterrupted, and reliable supply rather than offering promotions and discounts,
- offering regular user discounts and promotions while offering the same low price if you buy in large quantities
- domestic producers need to set prices lower than imported products,

For the entity users, the domestically produced recycled products were evaluated on a scale of 1-5 (1=poor, 5=very good). Price, availability, and continuity were rated 2.5. This suggests that they were the main weaknesses. Quality was evaluated at 3.6, hygiene and safety was rated 3.5, and variety was rated 3.1.

Figure 39. *The evaluation on the domestically made plastic products, 1 refers to "poor" and 5 "very good"*

Figure 40. *What the entity users look for when buying domestically made plastic products, %*

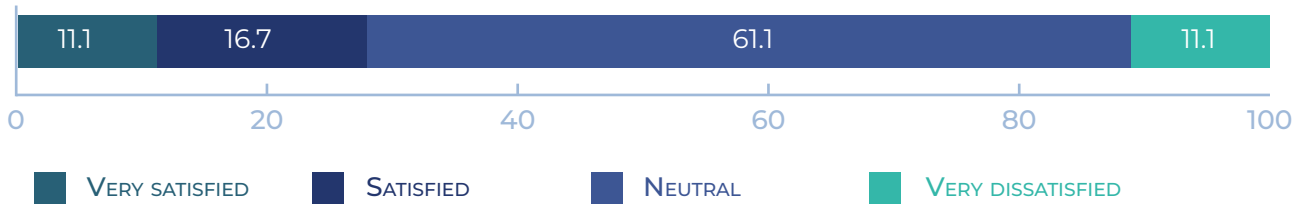


The entity users gave the most importance to the quality and durability of products (71.4%), price (61.9%), hygiene and quality standard compliance (19%), product features and design and variety (19%), and ingredients (14.3%) when purchasing domestically produced recycled plastic products.

4.2.2. ENTITY USERS' SATISFACTION AND INTEREST AND EXPECTATIONS

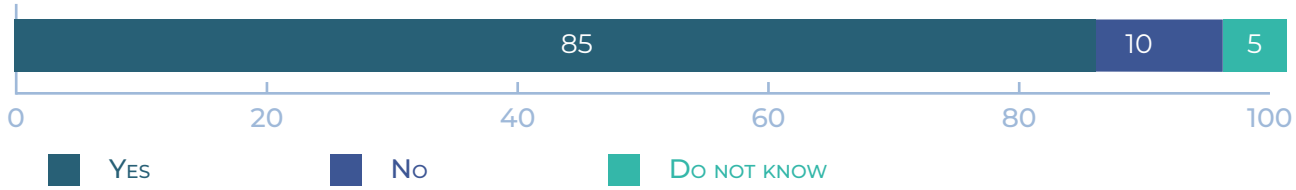
Looking at the entity users' satisfaction of currently used domestically produced recycled plastic products, 27.8% of them were "highly satisfied," 61.1% were "neutral," and 11.1% were "very dissatisfied."

Figure 41. *The entity users' satisfaction with the domestically made plastic products, %*



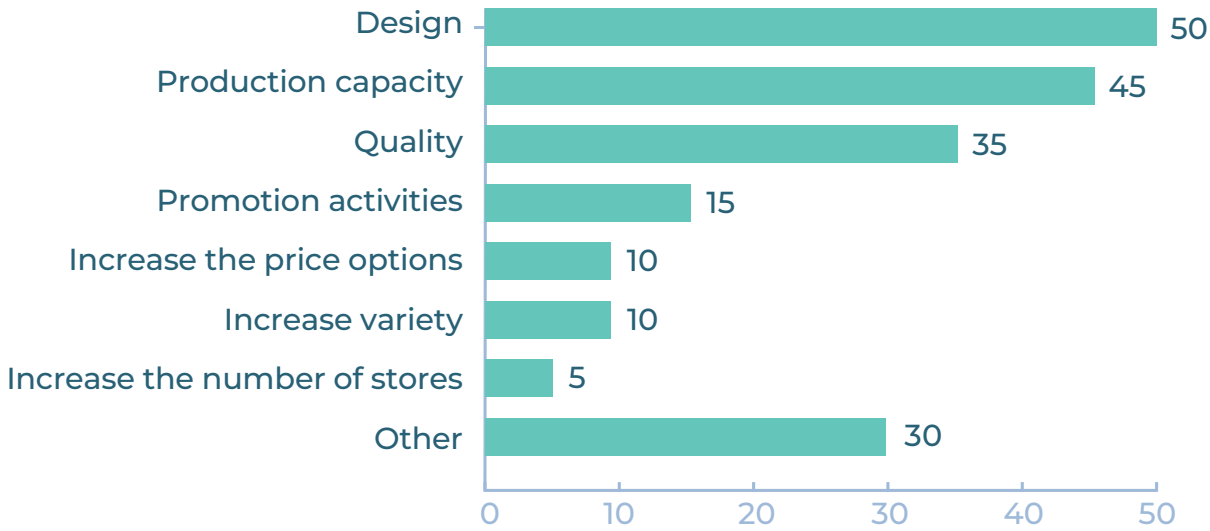
85% of the entity users were interested in buying and using domestically produced recycled plastic products. It can be seen that there was a high interest of the entity users in supporting domestic production.

Figure 42. *Whether the entities would buy domestically made plastic products in the future, %*



Entity users reported that domestically produced recycled plastic products needs the following improvements the most: design (50%), production capacity (45%), quality (35%), and promotion (15%).

Figure 43. *The improvement needs domestically produced recycled plastic products, %*



.52.4% of the entity users sorted their waste, 28.6% delivered their waste to recycling plants, 20% had import and purchase contracts with manufacturers that included the cost of collecting, reusing, recycling, and disposal of product plastic packaging waste, and 4.8% had provisions in their procurement procedures to purchase products with recyclable packaging. However, there is no organization that includes recycled products in its procurement procedures.

Figure 44. *Interest in expanding cooperation with the domestic manufacturers, %*

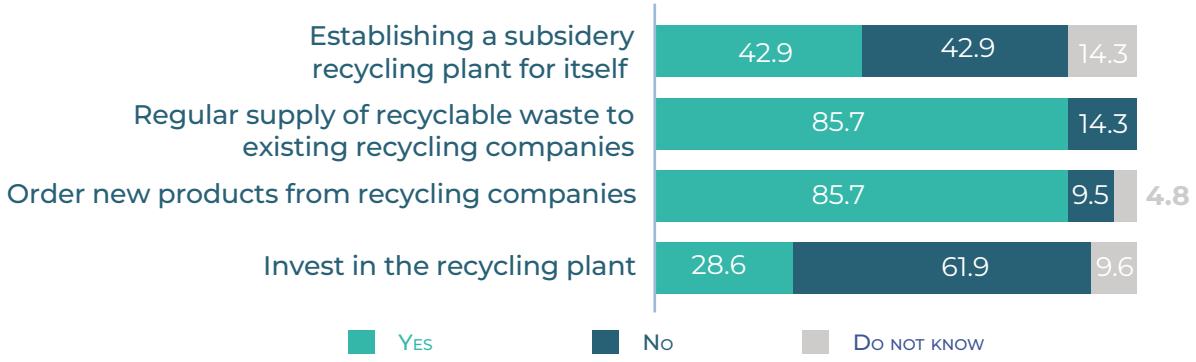
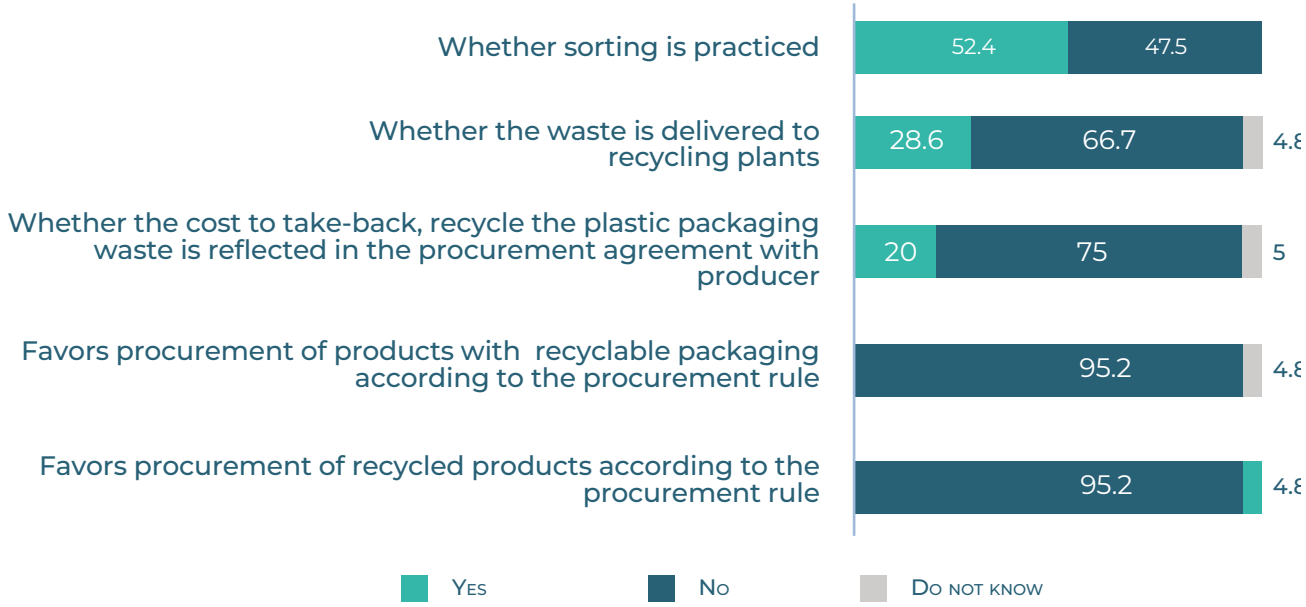


Figure 45. *Sorting and recycling practice, %/*



18 distributors and importers who buy and sell plastic products were surveyed. They considered the following as the main opportunities to produce the products that could replace the imported products:

- produce a large water storage tank as there is an increase in the number of people living in the summer camp in recent years,
- the domestic manufacturers are able to produce all kinds of plastic products supplied from China, including fans, plumbing lines, telephone guards, sewer pipes, window shutters, ventilation pipes, water pipes, wind shutters, which are used in apartments,

- produce portable 20- and 60-liter containers in accordance with standard requirements and re-supply to the market
- produce daily use trash cans, buckets and nets.

The retailers said sales of plastic products are good and high in demand. When asking the retailers which products are more in demand, imported or domestic, the imported products were higher in sales. The retailers reported price differences between imports and domestic products as the primary reason. For example, an imported water tank costs MNT 10,000 while a domestic tank sells for MNT 30,000. The domestically made drainage pipes are in limited size and design and usually do not fit consumers' need because of less variety.

In other words, retailers believed that imported products were better than domestically produced products in terms of design, construction, color and price. The users are generally interested in buying Korean and Russian products. The distributors highlighted market demand for domestically produced end products. The general public are also seen to support domestic production.

INTEGRATED CONCLUSION

In this study, we conducted analysis of the existing recycling, production and plastic waste market in Mongolia. We identified the challenges and barriers to growth of the market for recycled plastic products. We studied the demand for plastic products and the behavior of household and entity users. Our research was able to uncover potential new products and the market capacity of recycled plastic products.

We also studied international best practice and trends in the production and use of recycled plastic products. We conducted a desk review of the existing legal and regulatory environment around the production of plastic products. A supply-side analysis was conducted based on primary quantitative data collected from plastic waste collection points located in Ulaanbaatar, recycling manufacturers, importers and distributors of plastic goods and materials, and MCGA data. The analysis of the demand side was based on data collected from users of Bulgan province and 9 districts of Ulaanbaatar. The quantitative data results were combined with interviews conducted with the relevant government institutions, professional associations, and experts in charge of projects and programs. The following conclusions were made based on this analysis.

With the growth of the world population, rapid industrialization, the production and consumption of plastic products has accelerated in recent years and will continue to grow in the future. This increase in global waste generation has triggered and intensified global effort to implement a circular economy and create an environmentally sustainable economic structure. The share of recycled raw materials in production inputs is increasing, and improved recycling practices are being introduced globally.

Since China, a major player in the waste processing industry, stopped importing waste in 2018, countries around the world have been faced with the challenge of dealing with waste. Mongolia is no exception. There is a greater need and demand for domestic recycling of plastic waste. As of 2016, Mongolia ranked 9th among top 10 countries for plastic use per capita. This highlights a need to take effective measures to improve waste management, reduce waste, and increase recycling.

There are 24 manufacturers of recycled plastic products in Mongolia registered with the Ministry of Industry and Trade, 18 of which are in a stable operation. As of in 2021, they had an average annual sales income of MNT 19.2 billion. 31.3% of the market's total sales revenue was allocated to a single producer, 47.4% to the medium sized ten producers, and the remaining 21.3% to the small seven producers.

The survey results show that Mongolia has a total plastic recycling capacity of 18,500 tons as of July 2022, but only 52.4% of its capacity has been in use. In other words, together they produced approximately 10,000 tons of recycled plastic.
Recycling plants in Mongolia are relatively new and small. The manufacturers had an average of 18 employees, and two thirds of the manufacturers have been in business for less than 10 years.

There is no specific pattern for the manufacturers' recycling or collection raw materials. They collect raw materials in all kinds of ways, from recycling points, contractors, individual waste sorting, or going to stores to collect recyclables themselves. Although there is a legal and regulatory system available for sorting, separating and recycling waste, the implementation is lagging. Manufacturers mostly buy HDPE, LDPE, and PE waste, and as of July 2022, the amount of plastic waste they collect has reached a total of 8737.2 tons per year. 45% of the manufacturers import primary raw materials such as chemical additives and pure plastic pellets, mostly from China and South Korea, while the remaining 55% did not import raw materials and met their needs domestically.

Recycling plants mainly produce HDPE and LDPE pellets and garbage bags. The number of manufacturers is small, and they primarily manufacture products such as electrical conduits, clean and waste water pipes, plastic chairs and packaging. Most of them sell their end products from their factories to entity userss on a cost-based pricing system. Out of 18 manufacturers, only one produces pellets for export. Others sell their products in Ulaanbaatar city and rural areas. Because almost all transactions are done through cooperative agreements, some distributors and household users are poorly informed about recycled products. Manufacturers need to improve their knowledge and skills in marketing, advertising, and social media content development to increase their sales channels and introduce their products to a wider market.

Plastic importers and distributors evaluated the ability of recycled products to replace and compete with imported products based on criteria such as product quality, color, features, design, and price and gave relatively low score on each criteria. According to the retailers, the COVID-19 pandemic may have given the domestic producers an opportunity to supply recycled plastic products to the market, get recognized in the market, and strengthen their position during border closures. Some domestic products have defects and cannot meet industry standards. Due to the poor capacity of domestic manufacturers, they cannot get orders and fail to meet the demand. Sometimes their orders are delivered late. There is no capacity for large orders. The users do not make purchases because the products are not advertised or introduced to users. The distributors believe that several issues need to be addressed and improved, including providing incentives, discounts, or support to distributors.

The manufacturers interviewed for the survey, are interested in producing electrical protection pipes, pipes, nets with logos, sewage plastic pipes, drainage pipes, shovels, tamp tanks, moulds, animal watering tubs, terrace floors, outer setkan cushions, electric pipe connectors, inner metal pipes, switch sockets, ropes, grass ropes, clean and waste water pipes, users bags, sacks, various other cables, plastic pipe accessories, ventilation pipes, deep wells, building panels, stairs, plastic roofs for houses, and fence posts for agriculture. 38.9% of them said that they need to improve their equipment and improve their production capacity. However, they are facing financial and investment issues. 22.2% of them said that the quality and continuous availability of raw materials is important for consistent supply of recycling industry.

Since the beginning of 2020, the COVID-19 pandemic has spread around the world, and export and import flows were restricted. Therefore, the 2019 data of MCGA was used to determine the market capacity and to study products that can replace imported products. In of 2019, a total of MNT 355.4 billion worth of plastic goods and materials were imported into Mongolia. Two thirds of the total imports came from China, and the rest comes from more than 80 countries, including South Korea, Russia, the United States, Australia, and Germany. A total of 3,601 enterprises, organizations, and individuals imported goods and materials, led by HMNH LLC, APU, Vitafit-Invest, MCM Group, Obplastik, Dulamhuos, Tsonjai, Oyutolgoi, MCM Group with FIE, and Kemex. These large plastic product importing companies highest monetary value plastic imports included water and beverage bottle blanks, raw materials, stoppers, labels, seals, polyethylene terephthalate, and plastic film.
Considering the total amount of imports, polyethylene, polystyrene, various pipes, plastic blanks, stoppers, films, containers, bags, panels, linoleum, polymers, plastic floors, labels, polyacrylamide, and porlon products have the highest base value. It is planned to produce various pipes, plastic billets, bags and plastic floors from these goods and materials. As of 2019, various pipes worth MNT 30.6 billion MNT, billets worth MNT 30.0 billion, bags worth MNT 16.3 billion, and plastic flooring MNT worth 8.4 billion were imported. Comparing this with the total sales volume of the domestic market for plastic recycling, which is MNT 19.2 billion, it can be seen that there is a lot of potential for domestic manufacturers to replace

imports, increase sales revenue, and expand their market if they produce these products. Garbage bags are currently the most common final product produced by recycling plants, and in 2019, MNT 5.1 million worth of garbage bags were imported. This is equal to 0.001% of the total import. The surveyed manufacturers also indicated that they plan to increase production of shovels, shovel handles, and plastic chairs, which together accounted for less than 1% of total imports in 2019. In other words, the market value of the products planned to be produced by the current producers and the share of imports is very small. The small market capacity could be seen from the data.

THE HOUSEHOLD USERS DEMAND SURVEY CONCLUSION

Household users lack knowledge of plastic products. There is insufficient information about plastic products for household users in Ulaanbaatar and Bulgan province. 61.3% of respondents don't get informed about plastic products at all. The main source of information is Facebook and television for the household users.

To increase the knowledge of users, the project can cooperate with the manufacturers to organize activities to improve public awareness of these products. For example, manufacturers could set up an information hall for users, a waste reception point, or a window to view the manufacturing process. In recent years, increased awareness of environmental impacts has led to increased household sorting of waste and personally handing over recyclables to recycling centers. They will be able to get introduced to the next stages of recycling and reasons recycling is important if they are shown the production process. This could contribute to the sales of products.

Sorting, reusing and recycling of plastic products is becoming common among household users. 36.6% of the household users said they reuse plastic products and put plastic recyclables into green-labeled waste bins (52.2%). These efforts are less effective when waste management organizations mix the products into one container when the waste is collected. The manufacturers can cooperate with AOAs to collect the products. This can limit the competition and price increase, which could be caused by the shortage of the secondary raw products.

Majority of the household users said they want to reduce the use of plastic products in the future. Products such as household garbage bags, plastic bags, household plastic bottles, plastic water bottles, plastic chairs, and flower pots are highly used. These types of imported products are ready to be replaced by domestically produced products. Household users are ready to buy domestically produced products. There is a need and opportunity to produce the above products with high user demand and sell through consumer sales channels.

When purchasing plastic products for household users, quality, durability, ease of use, odorlessness, organic, and environmentally friendly products are important to consumers. 42.1% of the household users are interested in buying recycled plastic products manufactured in Mongolia at a higher price than imported products, and on average, they willing to pay up to 22.4% more.

THE ENTITY USERS DEMAND SURVEY CONCLUSION

The current price and availability of domestically produced recycled plastic products are rated below average for entity users, while quality, hygiene and safety, and variety of the products are evaluated as above average.

For entity users, when purchasing domestically produced recycled plastic products, quality, durability, price, hygiene, compliance with quality standards, product design, variety, selection, and ingredients are important indicators.

85% of the entity users are interested in buying and using domestically produced recycled plastic products in the future. They highlighted the importance of improving product

design, production capacity, quality, and promotion.
For domestic plastic product manufacturers, there is a significant opportunity to expand cooperation with entity users.

Users are choosing imported products due to their design, construction, color and low price. Demand of Korean and Russian products is relatively higher. However, retailers pointed out the users are more becoming more interested in buying domestically made products.
Challenges faced by manufacturers in recycling plastic and introducing it to the market were identified, and these challenges can be grouped as legal and regulatory, technology, raw material supply, sales, and users' attitudes. Problems and restrictions related to the sale and supply of plastic products from importers and distributors were clarified and combined in the corresponding section of the report. The practical significance of this research lies in the fact that policymakers, law and regulation enforcers, international donor organizations, and stakeholders in the plastic market should pay attention to mitigating these problems.

RECOMMENDATION TO IMPROVE THE PRODUCTS AVAILABLE

The manufacturers producing construction materials, tools, and equipment need to consider the seasonality of construction production and improve their product production and sales management. Particularly, it is necessary to get bulk orders in the summer, prepare raw materials and human resources for production, and organize them optimally. Manufacturers of garbage bags, sacks, and containers should pay more attention to the color, features, and design of their products.

The manufacturers need to improve the quality, features, and design of their current products and set the lowest possible price to compete with similar imported products.
лах, сурталчлах үйл ажиллагааг өргөн зохион байгуулах хэрэгтэй байна.

DEMANDS AND SUPPLY OF NEW PRODUCTS

In addition, the manufacturers have the opportunity to increase their sales channels and supply their products to household users in addition to entity users. Specifically, in addition to selling products to entity userss in bulk or to order, it is necessary to sell products in retail settings at a competitive price with imported goods and to be known to household users. Also, it is necessary to widely organize public awareness and promotion activities about the manufactured products:

- ☑ various types of sewer pipes, including internal sewage lines, wide pipes of sewage wells, and their fittings,
- ☑ electrical protective pipes, plastic pipe accessories, electrical pipe connectors, pipes with metal inside, socket caps, and many other types of cables,
- ☑ a variety of pipes, including water pipes, drainage pipes, ventilation pipes, and their fittings,
- ☑ house roofing, building plastic panels, stairs, formwork, outdoor terrace floor,
- ☑ grass ties, fence posts, shovels, utility sacks,
- ☑ a variety of bags, nets, sacks, utensils.

The import of various plastic pipes accounted for 8.61% of the total plastic product import in 2019, with a base value of MNT 30.6 billion, which was 1.6 times higher than the total sales of the domestic plastic recycling market of MNT 19.2 billion. This suggests that there is market capacity to absorb even if all domestic producers produce plastic pipes, increasing current production by 1.6 times. It was seen from the analysis of the current situation of imported products made in section 3.6 of the report that there is a large demand, need, and capacity of the domestic market to replace the imports for the fences, various plastic blanks, roofs, panels, outdoor and indoor plastic floors, bags, and nets.

If the following types of products imported by large enterprises are produced domestically, it will replace imports, recycle plastic, and make environmentally friendly and socially beneficial products available in the market.

- ☑ Caps and stoppers for food products such as drinks, water, liquor, and beer
- ☑ Labeling of various goods and materials
- ☑ Various colors and designs, company name logo, plastic film and bag
- ☑ Various plastic blanks

It should be noted that the goods and materials imported by the above-mentioned large enterprises are not produced by the surveyed manufacturers and they have no plans to produce them in the near future. Supplying goods and materials to meet the needs of domestic enterprises and organizations is an important opportunity to replace imported products and enter the market.

The surveyed manufacturers plan to improve the colors, features, and design of garbage bags, buckets, shovels, and chairs soon.

However, 2019 data of the MCGA shows the import value of these products together was less than 1% of total plastic import, which means that the market capacity is likely to be low. Manufacturers should be aware of limited market capacity.

As of today, most of the manufacturers do not have a standard conformity certificate for their products. This is considered to be one of the tasks that must be done under the project to ensure the conformity of the plastic industry.

Also, financial capacity should be improved to ensure the economic sustainability of production. This could be solved by the introduction of new products. For example, under the One Billion Trees project, seedling pots could be made from waste plastic to promote sustainability of recycling and import substitution.

STAKEHOLDER SPECIFIC RECOMMENDATIONS

General recommendations	Specific recommendatio	Relevant stakeholder
Adopt standards for recycled plastic products	The project should provide financial and consultation support to companies planning to introduce quality management system standards	Project team
	It is necessary to approve, improve, and implement new standards for some domestically produced plastic products. In particular, the importance of food packaging products standards was highlighted	MNRA, NGO that serves society, Mongolian Agency for Standardization and Metrology
	Terms, classifications, and criteria used in the industry should be agreed by the parties	MNRA, NGO that serves society, MSMEs
Brand development of recycled plastic products	Methodological and financial support should be provided to MSMEs in product packaging and brand development	Project team
	Promotion activities should be intensified to introduce recycled plastic products to users and develop a nationally recognized brand, such as plumbing and sewer products	MSMEs

Expand the cooperation of the parties	Measures to expand cooperation between waste producers and importers with MSMEs should be organized. For example, the implementation of the joint orders of the MET and the MoF should be ensured	Government organizations, Project team, MNRA, NGO that serves society
	Opportunities for the regular supply of recycled products should be created, receiving orders for new products, and expanding production with waste producers and importers	MNRA, NGO that serves society, MSMEs
	The manufacturers are relatively young, small, and have few employees, so they can join together, increase production capacity, and work together	MSMEs
	For MSMEs, it is necessary to expand cooperation with AOAs and large organizations and work together on sorting raw materials	MNRA, NGO that serves society, Project team
	Measures to reduce the seasonal dependence of product supply should be taken. For example, products high in demand in the summer should be produced and stored for winter times	MSMEs
	The implementation of the relevant law on waste sorting and recycling should be ensured and cooperation with government agencies should be enhanced	Government organizations, MNRA, NGO that serves society
Product and marketing development	Products that can replace imported products should be developed, such as water reservoirs, food utensils, cages, chairs, tables, poles, brooms etc.	MSMEs
	Coping strategies for secondary raw materials challenges should be developed	MNRA, NGO that serves society, MSMEs
	Equipment capacity should be increased to improve product quality, produce new products, and fully utilize production capacity	MSMEs
	Learn from high standard factories and share experience to create new opportunities	Project team, MSMEs
	Create incentives for the sale of domestically produced plastic products, such as lending products, offering long-term discounts, and introducing delivery services	MSMEs

	In terms of raw materials and industry specific products, it is not possible to supply the product to the mass market, so develop it aiming at the target market	MSMEs
	Supply sales directly to end users without passing through middlemen	MSMEs
	Improve the quality, hygiene, product design, types, and ingredients of domestic plastic products, and clarify the origin	MSMEs
	Public advocacy should be organized through an information hall, a waste reception point, and a showing production process	MSMEs
	Regularly provide clear and systematic information to users through the main channels	MSMEs, Project team, MNRA, NGO that serves societ
Provide financial and investment support	The MSMEs working in the areas of waste reduction, sorting, and recycling should be included in the categories of environmentally friendly, green economy and MSMEs in the policy and program if they can demonstrate minimal environmental impacts at their facilities	Government organizations, MNRA, NGO that serves society, MSMEs
	Join and cooperate with the waste sorting network of Ulaanbaatar	Municipal Governor Office, MNRA, NGO that serves society, MSMEs, Project team
	Connect MSMEs with FIEs	Project team
	The government should provide tax exemptions and financial support to MSMEs to improve their equipment and solve their working capital issues	Government organization

Construction and Demolition Recycling. (2018 оны July 9).
Recycling Today . Is China's shift to plastic pellet imports gaining steam?: https://www.recyclingtoday.com/article/china-recycled-plastic-pellet-imports-2018/-ээс Гаргасан

Global Recycle. (2022 оны August).
Which Country Recycle the Most? Which Country Recycle the Most?: https://globalrecycle.net/which-country-recycle-the-most/-ээс Гаргасан

Organization for Economic Cooperation and Development. (2022 оны Feb 22).
OECD Better Policies fro Better Lives. Plastic pollution is growing relentlessly as waste management and recycling fall short, says OECD: https://www.oecd.org/environment/plastic-pollution-is-growing-relentlessly-as-waste-management-and-recycling-fall-short.htm#:~:text=Only%209%25%20of%20plastic%20waste%20is%20recycled%20%2815%25,terrestrial%20or%20aquatic%20environments%2C%20especially%20i-ээс Гаргасан

Organization for Economic Cooperation and Development. (22 Feb 2022).
Global Plastics Outlook: Economic Drivers, Environmental Impacts and Policy Options. https://doi.org/10.1787/de747aef-en: OECD.

Plastic Pollution by Country 2022. (2022).
https://worldpopulationreview.com/country-rankings/plastic-pollution-by-country-ээс Гаргасан

World Population Review. (2022).
Plastic Pollution by Country 2022. https://worldpopulationreview.com/country-rankings/plastic-pollution-by-country.

Environmental Information Center. (2017).

Batjargal.D, T. M. (2021)
Research report. Ulaanbaatar.

Dagmar Volo, Thomashinova, Thomash Foitik . (September 2021).
Research on the status of plastic waste reduction, sorting, collection and transportatoin activities. Prague: SPRIM project.

Ministry of Agriculture and Light Industry . (2022, 05 17).
Retrieved from https://mofa.gov.mn/exp/blog/11/232

ANNEX

ANNEX 1: USER SURVEY QUESTIONNAIRE

INTRODUCTION OF THE SURVEY

MIRIM consultant is organizing the survey. The objective of the survey is to study demands and supply of the recycled plastic products in Mongolia and determine the potential of the domestic market.

We kindly request for your active participation and accurate responses. The confidentiality of the information you provide here will be strictly protected under the relevant laws and regulations. Your responses will be used only for the study purposes.

RESEARCHER CODE: _____

ONE. RESPONDENT INFORMATION

Name:_____
Position: _____
Phone number: _____

TWO. ENTITY INFORMATION

#	Question	Response
1	Name of the entity	.....
2	No. of staff	.....
3	Years of operation	.....
4	Types of the organization	1. Group, partnership, cooperative 2. Company 3. NGO 4. Entrepreneur 5. Other
5	Area of operation	1. Agriculture, forestry, fishing and hunting 2. Mining 3. Processing plant 4. Supply of electricity, gas, steam and ventilation 5. Water supply, sewage, waste management and cleaning operations 6. Construction 7. Wholesale and retail 8. Hotel, apartment, and catering services 9. Information and communication 10. Other .....

THREE. MAIN QUESTIONS

<table>
<tr><th>#</th><th>Questions</th><th>Responses</th></tr>
<tr><td>6</td><td>What types of plastic products does your organization use in its production?</td><td>1. .....
2. .....
3. .....</td></tr>
<tr><td>7</td><td>Where does your organization source its plastic products?

Give a response in %</td><td>
<table>
<tr><th>№</th><th>Type</th><th>%</th></tr>
<tr><td>1</td><td>From manufacturers</td><td></td></tr>
<tr><td>2</td><td>From wholesale centers (domestically made products)</td><td></td></tr>
<tr><td>3</td><td>From wholesale centers (imported products)</td><td></td></tr>
<tr><td>4</td><td>Import ourselves</td><td></td></tr>
<tr><td>5</td><td>Other</td><td></td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Where is your organization interested in buying manufactured plastic products?</td><td>1. Domestic products
2. Imported products
3. Either</td></tr>
<tr><td>9</td><td>What are the advantages of plastic products made by domestic manufacturers?</td><td>.....</td></tr>
<tr><td>10</td><td>What are the weaknesses of plastic products made by domestic manufacturers?</td><td>.....</td></tr>
<tr><td>11</td><td>What kind of the products do you need to replace</td><td>1. .....
2. .....</td></tr>
<tr><td></td><td>imports in your company's production?</td><td>3. .....</td></tr>
<tr><td>12</td><td>Do you have cooperation or agreement with the domestic plastic manufacturers?</td><td>1. Yes
2. No</td></tr>
<tr><td>13</td><td>If yes, what are the advantages of cooperating with others?</td><td>.....</td></tr>
<tr><td>14</td><td>Do domestic manufacturers provide incentive and discounts for purchasing plastic products?</td><td>1. Yes
2. No</td></tr>
<tr><td>15</td><td>If yes, what kind of discounts and incentive are offered?</td><td>.....</td></tr>
<tr><td>16</td><td>If no, what discount or incentives would you be in favor of?</td><td>.....</td></tr>
</table>

<table>
<tr><td>17</td><td>How would you rate the following features of the domestically produced recycled products?
1 refers to “poor” and 5 “good”</td><td>
<table>
<tr><th>№</th><th>Items</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>Don’t know</th></tr>
<tr><td>1</td><td>Price</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Quality</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>Hygiene and safety</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Availability – continuous supply</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>Variety</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>18</td><td>What would you prefer the most when choose the domestically produced plastic products?

Select up to 3 items</td><td>1. Supporting domestic production
2. Influence of other users and their feedback
3. Discount and incentives
4. Loan terms
5. Possibility get an order
6. Promotion activities
7. User friendliness
8. Price
9. Product models, types and variety
10. Continuity of supply
11. Odorless
12. Quality and durability
13. Color choices
14. Environmentally friendly
15. Proximity of the location
16. In compliant with the hygiene and quality standards
17. Other.....</td></tr>
<tr><td colspan="3">3.3. User satisfaction and purchase, preference and expectations</td></tr>
<tr><td>19</td><td>How satisfied is your organization with its use of domestically produced recycled plastic products?</td><td>1. Very satisfied
2. Satisfied
3. Neutral
4. Unsatisfied
5. Very unsatisfied</td></tr>
<tr><td>20</td><td>Is your organization willing to buy and use domestically produced</td><td>1. Yes
2. No</td></tr>
<tr><td></td><td>recycled plastic products in the future?</td><td></td></tr>
<tr><td>21</td><td>If yes/no, why?</td><td></td></tr>
<tr><td>22</td><td>What improvements do you think it is needed for the domestically produced recycled plastic products?

Select up to 3 items.</td><td>1. Quality
2. Variety
3. Ingredients
4. Discount and incentives
5. Number of stores
6. Price options
7. Features and designs
8. Number of products promoted
9. Promotion activities
10. Production capacity
11. Other (specify .....)</td></tr>
<tr><td>23</td><td>Is your organization interested in expanding cooperation with domestic plastic product manufacturers in the following areas?</td><td>
<table>
<tr><th>№</th><th>Items</th><th>Yes</th><th>No</th></tr>
<tr><td>1</td><td>Joint investment in manufacturing</td><td></td><td></td></tr>
<tr><td>2</td><td>Order new products</td><td></td><td></td></tr>
<tr><td>3</td><td>Regular supply of recycled products</td><td></td><td></td></tr>
<tr><td>4</td><td>Establishing a plant for self-recycling</td><td></td><td></td></tr>
</table>
</td></tr>
</table>

24	What are the potential plastic products that can be produced in Mongolia?	1. ..... 2. ..... 3. .....
25	Does your organization sort the waste?	1. Yes 2. No
26	Does your organization deliver its waste to recycling plants?	1. Yes 2. No
27	Does your organization include the cost of collection, reuse, recycling and disposal of product plastic packaging waste in any import or manufacturer purchase contract?	1. Yes 2. No
28	What needs to be to improve the cooperation with the domestic products?	
29	Does your organization's procurement procedure include the provisions regarding to the prioritization of buying the recycled products? If yes, what does the clause say?	1. Yes 2. No
30	Do your organization's procurement procedures include a provision regarding giving a	1. Yes 2. No
	preference to recyclable products?	
31	If yes, what does the clause say?	.....

ANNEX 2: MIRCO, SMALL AND MEDIUM-SIZED ENTERPRISES SURVEY QUESTIONNAIRE

Under the "Sustainable Plastic Recycling in Mongolia" project, funded by the European Union's Switch-Asia program, Caritas Czech Republic is conducting Research on the Market Opportunities of Recycled Plastic Products in Mongolia. As the survey results will be used to plan project activities in the future, we kindly request for your active participation and accurate information. The confidentiality of the information you provide here will be strictly protected under the relevant laws and regulations. Your responses will be used only for the study purposes. If you agree to participate in the survey, our interview will be recorded. If you do not want to get it recorded, please let us know.

(The questionnaire is only for executive director, finance and operations manager or senior officer)

<table>
<tr><th>№</th><th>Question</th><th>Response</th></tr>
<tr><td colspan="3">Respondent information</td></tr>
<tr><td>1</td><td>Name</td><td></td></tr>
<tr><td>2</td><td>Position</td><td>1. Executive director
2. Finance and operations manager and senior officer
3. Other .....</td></tr>
<tr><td>3</td><td>Contact details</td><td></td></tr>
<tr><td colspan="3">Organization information</td></tr>
<tr><td>4</td><td>Name</td><td></td></tr>
<tr><td>5</td><td>Years of operations</td><td></td></tr>
<tr><td>6</td><td>No. of staff</td><td></td></tr>
<tr><td>7</td><td>Sales revenue (2021)</td><td></td></tr>
<tr><td colspan="3">Plant capacity and products</td></tr>
<tr><td>8</td><td>What is the capacity of your organization (tons per year)</td><td></td></tr>
<tr><td>9</td><td>What percentage of the total production capacity was used in 2021?</td><td></td></tr>
<tr><td>10</td><td>Tell us the types, quantity, and unit of price of the products of your organization.</td><td>
<table>
<tr><th>№</th><th>Types of products/items</th><th>No.</th><th>Unit price</th><th>Unit</th></tr>
<tr><td>1</td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td></td><td></td><td></td><td></td></tr>
<tr><td>6</td><td></td><td></td><td></td><td></td></tr>
<tr><td>7</td><td></td><td></td><td></td><td></td></tr>
<tr><td>8</td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>11</td><td>Tell us the origin and quantity of the products that your organization use as secondary raw products.
Give the response in % and tons</td><td>
<table>
<tr><th>№</th><th>Origin</th><th>%</th><th>Quantity in tons</th></tr>
<tr><td>1</td><td>From secondary resource collection points</td><td></td><td></td></tr>
<tr><td>2</td><td>From a subcontractor</td><td></td><td></td></tr>
<tr><td>3</td><td>Other</td><td></td><td></td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td>12</td><td>From which country does your organization supply primary raw materials (chemical additives, pure plastic pellets etc.) annually[1].

Give the response in % and tons</td><td>
<table>
<tr><th>№</th><th>Country</th><th>%</th><th>Quantity in tons</th></tr>
<tr><td>1</td><td></td><td></td><td></td></tr>
<tr><td>2</td><td></td><td></td><td></td></tr>
<tr><td>3</td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>13</td><td>How do you rate the quality, features and prices of the similar plastic products of the competitors in the same market?</td><td>1. Very good
2. Good
3. Moderate
4. Poor
5. Very poor</td></tr>
<tr><td>14</td><td>How satisfied are you with the products your organization supply in the market?</td><td>1. Very satisfied
2. Satisfied
3. Neutral
4. Dissatisfied
5. Very dissatisfied</td></tr>
<tr><td colspan="3">New product demands and plans</td></tr>
<tr><td>15</td><td>How does your organization see opportunities to increase the variety of recycled plastic products?

Name the products.</td><td>a. Products that can be produced by increasing the variety and quality of the currently produced products
……
b. Products that can be produced by increasing the current production lines and stages
……
……</td></tr>
<tr><td>16</td><td>What new products do your organization intend to introduce to the market in the next 5 years?
Name the products.</td><td>1. ……
2. ……
3. ……</td></tr>
<tr><td>17</td><td>What are the reasons of introducing the above-mentioned products particularly?</td><td>1. ……
2. ……
3. ……</td></tr>
<tr><td>18</td><td>What are the challenges in producing the above and other products from recycled plastic?</td><td>a) In terms of legal environments
……
……
b) In terms of technology
……
……
c) In terms of the supply of the raw materials
……
……
d) In terms of sales
……
……
e) In terms of the users’ perception
……
……</td></tr>
</table>

18	What are the challenges in producing the above and other products from recycled plastic?	a) In terms of legal environments ..... b) In terms of technology ..... c) In terms of the supply of the raw materials ..... d) In terms of sales ..... e) In terms of the users' perception .....
19	Where does your plant supply your products? Give the response in %.	1. From the manufacturers: .....% 2. From family producers: .....% 3. From wholesalers: .....% 4. Export: .....% 5. Other: .....%
20	Does your organization reflect the users' feedback in the production of the products?	1. Yes 2. No
21	If yes, how is it incorporated into?	.....
Market environment of the products		
22	Where do you sell your products?	1. For export 2. In Ulaanbaatar, Mongolia 3. In provinces of Mongolia 4. Other.....
23	What sales channels do you use? Multiple choices	1. In the markets 2. From the plant 3. With contractual distributors 4. Chain stores 5. Supermarket 6. "8" retail package stores 7. Mini market 8. Online shops 9. Other.....
24	Do you have an agreement with an entity that buy the products in bulk or directly?	1. Yes (how many contractors do you work with?) 2. No
25	How do you price the products?	1. Based on product cost 2. Based on the price of similar domestically made products 3. Based on the price of the similar imported products 4. Based on the agreement made with a contractor 5. Other.....

<table>
<tr><td>27</td><td>What promotion method do you use for sales?</td><td>1. Making loan available
2. Discount
3. Free delivery is offered
4. Provide advice
5. Giving warranty period
6. Return the defective products
7. Other .....</td></tr>
<tr><td>28</td><td>What do you pririotize the most when you introduce a product to the market?
(1 refers to “very low”; 5 “very high”)</td><td>
<table>
<tr><th>№</th><th>Items</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>Do not know</th></tr>
<tr><td>1</td><td>Reasonable price</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Quality</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>Hygiene and safety</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Availability – continuous supply</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>Variety</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>29</td><td>What makes your products stand out the products of your competitors?
What is the main feature?</td><td></td></tr>
<tr><td>30</td><td>What shoud be improved about your products to improve the sales of your products?</td><td>1. Quality
2. Variety
3. Ingredients
4. Discount and incentives
5. Number of stores
6. Price options
7. Features and designs
8. Number of products promoted
9. Promotion activities
10. Production capacity
11. Other (specify</td></tr>
<tr><td>31</td><td>How do you see the competitive opportunities of domestic manufacturers with the imported products?</td><td>1. .....
2. .....
3. .....</td></tr>
<tr><td>32</td><td>What training needs do you have to increase sales of your products?</td><td>.....</td></tr>
</table>

Thank you for your participation

ANNEX 3: GOVERNMENT ORGANIZATION SURVEY QUESTIONNAIRE

Introduction of the survey

MIRIM consultant is organizing the survey. The objective of the survey is to study demands and supply of the recycled plastic products in Mongolia and determine the potential of the domestic market.

We kindly request for your active participation and accurate responses. The confidentiality of the information you provide here will be strictly protected under the relevant laws and regulations. Your responses will be used only for the study purposes.

RESEARCHER INFORMATION: _____

RESEARCHER CODE:

Name of the respondent: _____
Name of the organization:_____
Position
Gender: _____
Phone number:_____

MAIN QUESTIONS

What incentive and regulations are in need to support domestic plastic recycling MSMEs?

А. In terms of equipment and hardware: .....
Б. In terms of funding:
В. In terms of human resource:
Г. In terms of workplace:
Д. In terms of products and services:
Е. Cooperation:

How do you see the opportunities of improving the plastic recycling system?

А. In terms of sorting and shipping:
Б. In terms of recycling and production of the final products:
В. In terms of selling and promoting the products:

How do you see the competitiveness of the domestic recycled plastic products with similar imported products in terms of their quality and price?)
In terms of legal environment:

How is the existing legal environment around the recycled plastic products
What are the common legal and regulatory issues?
What are the limiting factors of the competitiveness?

What could be solutions for legal and regulatory issues?

What articles and provisions of the laws need a revision?

How would you evaluate the results of the projects and programs on recycled plastic products?

10. How is the implementation of the Joint Resolution # A-429/257 of Minister of Environment and Tourism and Minister of Finance ensured? In case of bulk importing of plastic container and packaging products, is the availability of collecting, reusing, recycling, burying waste from products and their packaging related cost provisions checked? (Environment and Natural Resource Management Department, MET, Policy and Planning Department of the MoF, Mongolian Customs General Administration)

What should be done to ensure the implementation of the above-mentioned measures?

Thank you for your participation

ANNEX 4: HOUSEHOLD USERS SURVEY QUESTIONNAIRE

Introduction of the survey

MIRIM consultant is organizing the survey. The objective of the survey is to study demands and supply of the recycled plastic products in Mongolia and determine the potential of the domestic market.

We kindly request for your active participation and accurate responses. The confidentiality of the information you provide here will be strictly protected under the relevant laws and regulations. Your responses will be used only for the study purposes.

Researcher will fill this section

The survey should be continued if the screening question is passed.

Do you and does your household use plastic products?

Yes – continue the survey
No – End the survey

RESEARCHER CODE: _____

PHONE NUMBER OF THE RESPONDENT: _____

SOCIAL AND DEMOGRAPHIC QUESTIONS

#	Question	Response
1	Gender	1. Male 2. Female
2	Age group	1. 18-29 2. 30-44 3. 45-59 4. 60+
3	What is your average monthly income? (MNT)	1. Up to 500,000 2. 500,001-1,000,000 3. 1,000,001-1,500,000 4. 1,500,001-2,000,000 5. 2,000,001-2,500,000 6. More than 2,500,001
4	Educational attainment	1. Master and higher 2. Bachelor 3. Associate degree / TVET/ 4. Upper secondary 5. Lower secondary 6. Primary 7. Uneducated
5	What is the type of the accommodation?	1. Apartment 2. Ger areas 3. Summer house

MAIN QUESTIONS

<table>
<tr><th>#</th><th>Question</th><th>Response</th></tr>
<tr><td colspan="3">3.1. Perceptions and attitude towards recycled plastic products</td></tr>
<tr><td>6</td><td>How good is your knowledge about recycled plastic products?</td><td>1. Very good
2. Good
3. Neutral
4. Poor
5. Very poor</td></tr>
<tr><td>7</td><td>Answer each statement</td><td>
<table>
<tr><th>№</th><th>Item</th><th>Yes</th><th>No</th></tr>
<tr><td>1</td><td>I use plastic products more than once</td><td></td><td></td></tr>
<tr><td>2</td><td>I put plastic products in the waste bin with green label</td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Where do you get information about recycled plastic products?

Select up to 3 items.</td><td>1. Television
2. Facebook
3. Instagram
4. Twitter
5. Newspaper
6. Magazine
7. Website
8. FM, radio
9. Words of mouth
10. From store
11. Form big markets
12. From apartment owners' association
13. From family and friends
14. From colleagues
15. From the manufacturers
16. From retailers
17. Other (specify .....)</td></tr>
</table>

9	Is there sufficient information on domestic recycled products?	1. Sufficient enough 2. Not very sufficient 3. Very insufficient

3.2. knowledge and practice of recycled plastic products

10 What types of plastic product do you and your household use?

If you use, how frequent do you use?

Multiple choice

№	Item	Yes	No	Quantity (by year)
1	Water bottle /canister/			
2	Household plastic containers /pots/			
3	Garbage bag			
4	Plastic bags			
5	Plastic toys and souvenirs			
6	Plastic chair			
7	Plant pot			
8	Plastic food container			
9	Plastic spoon and fork			
10	Plastic cup			
11	Other			

11	How would change your use of plastic products?	1. Increase 2. Keep it as the same as today 3. Reduce 4. Cut it off completely
12	What is the reason to reduce the use of plastic? **Select up to 3 items**	1. Pricey 2. Limited variety and choices 3. Poor features 4. Low availability 5. Odor 6. Poor quality and durability 7. Limited choice of color 8. Non organic 9. Not environmentally friendly 10. Harmful to health 11. Other.....
13	Where is the plastic you buy usually made in? Multiple choice	1. China 2. Korea 3. Russia 4. Mongolia 5. Other 6. Any

14 What do you use plastic product use for?

№	**Items**	Always	Sometimes	Never
1	Food			
2	Household			
3	Public space /road and field etc./			

15	Where do you usually use plastic products? Multiple choice	1. At home 2. During trip 3. At work 4. When getting services 5. Other .....
16	What do you prefer about the plastic products? Select up to 3 items	1. User friendliness 2. Price 3. Variety and choice 4. Feature 5. Availability 6. Odorless 7. Quality and durability 8. Color choice 9. Having a certificate of origin 10. Environmental friendliness 11. Proximity 12. None of them 6. Other .....
17	What factors influence the decision to purchase plastic products? Select up to 2 items.	1. Family 2. Others' feedback 3. Discount 4. Household affordability 5. Price 6. Promotion 7. Own needs 8. Other (specify .....)
18	Would you buy the domestically made recycled plastic products with higher price than imported ones made from the same primary raw materials?	1. Yes 2. No
19	If yes, what is the maximum percent of difference would you allow?	1. .....
20	What would prefer about the materials of the plastic products?	1. Made from primary raw materials 2. Made from secondary raw materials 3. Mixed 4. Either 5. Do not know
21	What do you do with the plastic packages and containers once you use?	1. Throw away with other waste 2. Sort and give them to recycling points with fee 3. Reuse or give someone in need for free 4. Other
22	How satisfied are you with your use of plastic products?	1. Very satisfied 2. Satisfied 3. Neutral 4. Dissatisfied 5. Very dissatisfied

23	Would you be interested in buying plastic products made in Mongolia?	1. Yes 2. No
24	What improvements do you think it is needed for the domestically produced recycled plastic products? Select up to 3 items.	1. Quality 2. Variety 3. Ingredients 4. Discount and incentives 5. Number of stores 6. Price options 7. Features and designs 8. Number of products promoted 9. Promotion activities 10. Other (specify .....)
25	What other domestically made plastic products would you want to buy?	1. .....
26	Where do you usually buy plastic products? Select no fewer than 3 items s	1. From markets 2. From the plant 3. Chain stores 4. Supermarket 5. “8” retail package stores 6. Mini market 7. Online shop 8. Other.....

Thank you for your participation


9 789919 962531