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MAPPING OUT PLASTIC BAGS INDUSTRIES AND THE VALUE-CHAIN

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1. INTRODUCTION

Before the issue of plastic pollution in the sea surfaced, plastic was the prima donna for product packaging or shopping bag materials, and was widely used in everyday life. However, with the recently increasingly intense movement to reduce the use of plastics, the negative stigma is increasingly attached to plastics, especially single-use plastics. To respond to the risk of plastic pollution, a number of regions have issued policies prohibiting the use of single-use plastics, including plastic shopping bags. This negative stigma and prohibition policy then resulted in disruption of the plastic value chain.

Taking into account the production process, use and management after the end of the life of plastic products or packaging that has been running so far, the emergence of negative impacts from plastic stems from unsustainable patterns of production and consumption of materials. Thus, what is needed is to encourage changes in these patterns in a more sustainable direction; in line with Goal 12 of the Sustainable Development Goals, Ensure Responsible Production and Consumption Patterns. To be able to make this change, the participation and collaboration of all actors involved in the plastic value chain (various types of plastic), from upstream to downstream, are needed.

This document seeks to map the actors involved in the value chain of plastic bags, especially at the stage of managing the end-of-life of plastic bags. The results of this mapping are expected to provide strategic direction to encourage the role and collaboration between actors towards a circular economy in plastic shopping bags.

2. Plastic Shopping Bags and the Circular Economy

It is undeniable, despite the environmental issues surrounding it and the ban on the use of plastic shopping bags in some areas, that consumption of plastic shopping bags is still relatively high. Economic actors and people's daily lives still use plastic shopping bags because there is no substitute material that can provide the same function and at a similarly low cost.

The results of the Sustainable Waste Indonesia (SWI) study in 2019 estimated that the consumption of plastic shopping bags in the DKI Jakarta area reached 350 tons per day. In this study, the types of plastic shopping bags analyzed included those made from 100% virgin HDPE, oxo-degradable, recycled materials, and bioplastic. The results of further calculations in the same study show that economic transactions from the 350 tons of plastic shopping bags trade from SMEs in DKI Jakarta can reach IDR 6.5 billion every day.

Residents use plastic shopping bags not only as shopping bags, but also garbage bags. In fact, the majority of people use plastic shopping bags for their garbage bags, so it is certain that plastic shopping bags will enter the waste management chain. Issues related to plastic shopping bags and pollution arise when plastic shopping bags that has entered the final phase of its useful life are not managed and are wasted into the environment (e.g., burned or dumped into vacant land/water bodies).

More than 49 thousand informal workers in the solid waste sector (scavengers and aggregators) are able to collect around 1,800 tons of plastic shopping bags every day from

the Bantar Gebang Temporary Storage Facility and the area around DKI Jakarta. If you take into account the average price of plastic shopping bag waste, which is IDR 2,750 per kilogram, it is estimated that the economic turnover of waste buying and selling transactions in the informal sector of the DKI Jakarta area alone reaches IDR 9 billion per day.

Data from the Indonesia Plastic Recyclers Association (IPR) shows that recycling factories in DKI Jakarta and its surroundings receive at least 260 tons of plastic shopping bags waste that has undergone a pre-processing process (cleaned of water, soil residue and other impurities by informal sector actors). This waste is then used as raw material for recycled plastic shopping bags production. Considering the consumption rate of plastic shopping bags which is 350 tons per day, and the inflow of plastic shopping bags waste of 260 tons at the recycling plant, it can be said that the recycling rate of plastic shopping bags in DKI Jakarta and its surroundings is in the range of 74%.

Like the recycling process for other types of waste, the management of plastic shopping bags by the informal sector and this recycling plant has contributed to saving landfill land. The SWI study shows that only by taking into account the number of plastic shopping bags and HDPE bottles received by the recycling plant in DKI Jakarta which reaches 306 KT per year, this waste management process has been able to reduce the need for Temporary Storage Facility are by 31 Ha and extend the service life of the storage facility.



Figure 1 Circular Economic Data and Facts for plastic shopping bags (SWI, 2019)

The plastic shopping bags recycling rate of 74% is considered to be relatively high, but it should be noted that around 26% of plastic shopping bags waste has not been managed and has the potential to pollute the environment. To encourage this 26% management and maintain the existing management, synergy between actors in the plastic bag value chain is very much needed

3. Policies and Strategies to Reduce Consumption of plastic shopping bags

Policies related to the prohibition and phasing-out of the use of plastic shopping bags have been published both at the national and regional levels. The Minister of Environment Regulation number 75 of 2019 concerning the Roadmap for Waste Reduction is the legal umbrella for PE-based plastic shopping bags phasing-outs in 2030 for the food and beverage and retail service sectors. Meanwhile, at the regional level, it is recorded that 8 provinces/regencies/cities have issued a ban on the use of plastic shopping bags, including DKI Jakarta Province and Bogor City.

Reducing plastic pollution is the main goal of issuing this ban on the use of plastic shopping bags. Yet on the other hand, this policy has had a derivative impact. In areas where the use of plastic shopping bags is prohibited, a replacement shopping bag with a reusable character is needed. All shopping activities in the area will use reusable shopping bags, where it is possible that this shopping bag can also be used as a garbage bag (it is assumed that it follows plastic shopping bags function as a shopping bag as well as a garbage bag). This condition will certainly eliminate the plastic shopping bags business chain from upstream to downstream, along with the economic transactions in it. The decrease in economic value from the loss of trade and recycling of plastic shopping bags can reach IDR 15 billion only for the DKI Jakarta area and its surroundings. Moreover, there is no conclusive information regarding the acceptance of reusable bags in the recycling value chain, so that at the end of use, these bags may enter landfill cells without going through the recycling chain. This reusable bag also has the potential to be water-resistant or can make garbage easily spill into the environment.

The use of thick garbage bags as a substitute for plastic shopping bags for garbage bags also has the potential to occur. This thick garbage bag has a price of 5 times the price of plastic shopping bags and weighs 2 times plastic shopping bags, so that not only does it provide additional costs for waste management for the community, the use of thick garbage bags will also increase the weight of waste that must be managed. Not to mention the socio-economic impact of declining informal sector income and job losses related to the management and recycling of plastic shopping bags waste.

Apart from the policy of banning and phasing out plastic shopping bags, the Draft Government Regulation (RPP) on Excisable Goods in the Form of Wearable Bags is also a policy being formulated by the government to control plastic shopping bags consumption. Formulated in 2018, until the time this report is produced (2021), the regulation is still in the process of being drafted. This regulation also stipulates the criteria for plastic shopping bags that are not subject to excise duty, taking into account the composition, thickness, and function of the plastic shopping bags. The government regulation presented at the Discussion of the Draft Government Regulation on Excisable Goods in the Form of Plastic Bags in 2018, shows that excise duty is not collected for facilities that meet the following criteria:

- Has a thickness of $\mu 50$ (50 microns)
- Made entirely of environmentally friendly polymers without regard to the presence of other additives
- Intended for use as a final product packaging

- Intended to be used as garbage bags of a certain size and thickness
- Intended for use as a plant cultivation bag
- Directly transported or further transported to destinations outside the customs area
- Exported
- Put in factory or storage
- Used as raw materials or auxiliary materials in the manufacture of final products which are excisable goods
- Has been destroyed or damaged before being removed from the factory or before being granted import approval for use

In 2020, the Minister of Finance and Commission IX of the House of Representatives (DPR) said that the proposed excise rate for plastic shopping bags under this regulation draft was IDR 30,000 per kilogram or IDR 200 per sheet. For traditional markets that still use plastic shopping bags in their daily transactions, the price is IDR 200/sheet will certainly feel expensive. The people's economy, which has been the focus of government development, will be affected by this policy. In addition, many products sold in traditional markets have the character of wet products, so the use of reusable shopping bags will be unhygienic; plastic shopping bags is still needed as an initial coating before the product is put into a reusable bag.

Indonesia Plastic Recyclers has identified the potential negative impacts that could be caused by the enactment of this excise policy, including:

- There could be an increase in the selling price up to 300% of the current (non-excise) selling price, which in turn could trigger inflation.
- Swelling of Business Working Capital required up to 1,000% compared to the production capacity per month. This swelling of working capital can disrupt the financial stability of plastic recyclers.
- There was a decrease in market demand for recycled plastic shopping bags products due to a significant increase in selling prices.
- Declining interest in Micro, Small and Medium Enterprises (MSMEs) to continue their business in the Plastic Recycling industry due to the loss of 0.5% Final Income Tax incentives.
- A significant decrease in the absorption of plastic waste which results in the loss of the purpose of the excise tax itself (control of plastic waste).
- The decrease in potential state revenue from non-taxable MSMEs is due to decreased turnover due to high selling prices due to excise expenses.
- With the many prohibitions and excise regulations, the State will also lose potential revenue in the form of Income Tax and VAT from taxable recycling industry players who have stopped their business.
- Decrease in the number of available formal and informal jobs

The existence of negative impacts from the implementation of the policy on the prohibition of the use and excise of plastic shopping bags certainly needs attention, so that the existence

and operationalization of the policy do not become counterproductive and cause derivative impacts.

4. Actors in the Plastic Bag Value Chain

Actors in the plastic bag value chain can be divided into upstream, middle, and downstream actors; where each actor has his own role in the value chain and the management of plastic shopping bags.

a. Upstream

The upstream actors are the actors who produce plastic shopping bags using virgin plastic and non-recycled plastic shopping bags, including plastic shopping bags which is categorized as environmentally friendly. Examples of environmentally friendly plastic shopping bags are:

- plastic shopping bags made from biomass (biobased plastic)
- Biodegradable plastic shopping bags
- plastic shopping bags is made from compostable plastic
- plastic shopping bags oxo-degradable

The existence of a policy of reducing plastic shopping bags consumption will certainly greatly affect the business processes of plastic shopping bags producers, especially those using virgin plastic as their basic material. Changes in production patterns by combining virgin plastic with recycled plastic will also remain constrained if the flow of plastic waste to plastic recycling companies decreases as a result of this policy.

Meanwhile, for environmentally friendly plastic shopping bags producers, the existence of a policy of banning plastic shopping bags and the potential for imposition of excise is known to increase their market share because more companies or commercial businesses are utilizing their products. However, it should be noted that the production cost and selling price of environmentally friendly plastic shopping bags are higher than virgin plastic or recycled plastic shopping bags, so the market share of environmentally friendly plastic shopping bags will remain segmented. Its market reach will not be as wide as the producers of plastic shopping bags made of virgin plastic or recycled materials.

b. Middle

In the middle segment of the plastic shopping bags value chain, the actors who play a role are consumers, whether they are retail companies, shops, service providers or households/individuals. So far, plastic shopping bags made from virgin plastic or recycled plastic shopping bags is still the main choice for the majority of the population due to the relatively cheap price and flexibility of use (shopping bags, wrapping and garbage bags). Since the issuance of the policy prohibiting the use of plastic shopping bags, retail companies and stores in areas that have implemented this policy have no longer provided plastic shopping bags for their buyers. However, the use of plastic shopping bags can still be found in grocery stores, stalls and markets because there are no substitutes that can provide the same economic value. Household consumers or individuals with moderate to high socioeconomic levels may have sufficient willingness to pay to be able to use environmentally friendly plastic shopping bags or reusable bags whose prices are relatively high. However, for consumers

who are at a low-medium economic level, it is certainly not that easy to change the pattern of using their shopping bags.

Meanwhile, the use of environmentally friendly plastic shopping bags tends not to be a preference for retail entrepreneurs because the price is higher than ordinary plastic shopping bags, so its use will increase the company's operational costs. Retail companies can charge their consumers for using environmentally friendly plastic shopping bags, but not all consumers are willing to pay more for them. Environmentally friendly plastic shopping bags can also be used by companies engaged in food and beverage services as well as certain commercial businesses that have consumers from non-low income community. The market share for environmentally friendly plastic shopping bags is still limited (segmented) and cannot replace the market share of plastic shopping bags companies made from virgin plastic or wider recycling.

For actors in the middle segment of this value chain, consideration of socio-economic conditions becomes important in determining appropriate intervention steps to strengthen this value chain.

c. Downstream

The downstream segment of the plastic bag value chain is the management of plastic shopping bags after the end of their useful life, which means the actors involved are those who play a role in the management of plastic shopping bags waste. This plastic waste management process also has its own value chain, from upstream to downstream, with a specific management scope for each segment.

- Upstream Segment:
Plastic shopping bags waste management activities in this segment are activities related to waste collection, so the actors involved are actors who play a direct role in waste collection, namely: scavengers, waste bank units, Temporary Storage Facilities for Reduce, Reuse, and Recycle, Integrated Temporary Storage Facilities, Recycling Centers, and garbage collectors (public and private).
- Middle Segment
Actors in the middle segment will receive plastic shopping bags waste collected by actors in the upstream segment, so the main activity in this segment is the process of accumulating plastic shopping bags waste from various upstream actors. Pre-processing of plastic shopping bags waste is also part of activities in the middle segment. Considering its activities, there are three (3) actors who play a role in this segment, namely aggregators, main waste bank and Recycling Center. Aggregators are classified as informal actors, while main waste banks and recycling centers are semi-informal actors.
- Downstream Segment
The next process in the plastic shopping bags waste value chain is the recycling process of the collected and accumulated waste, so that the actors involved are

crushers, pelletizers and recycling plants. In this segment, the products produced are recycled products and raw materials for recycled products.

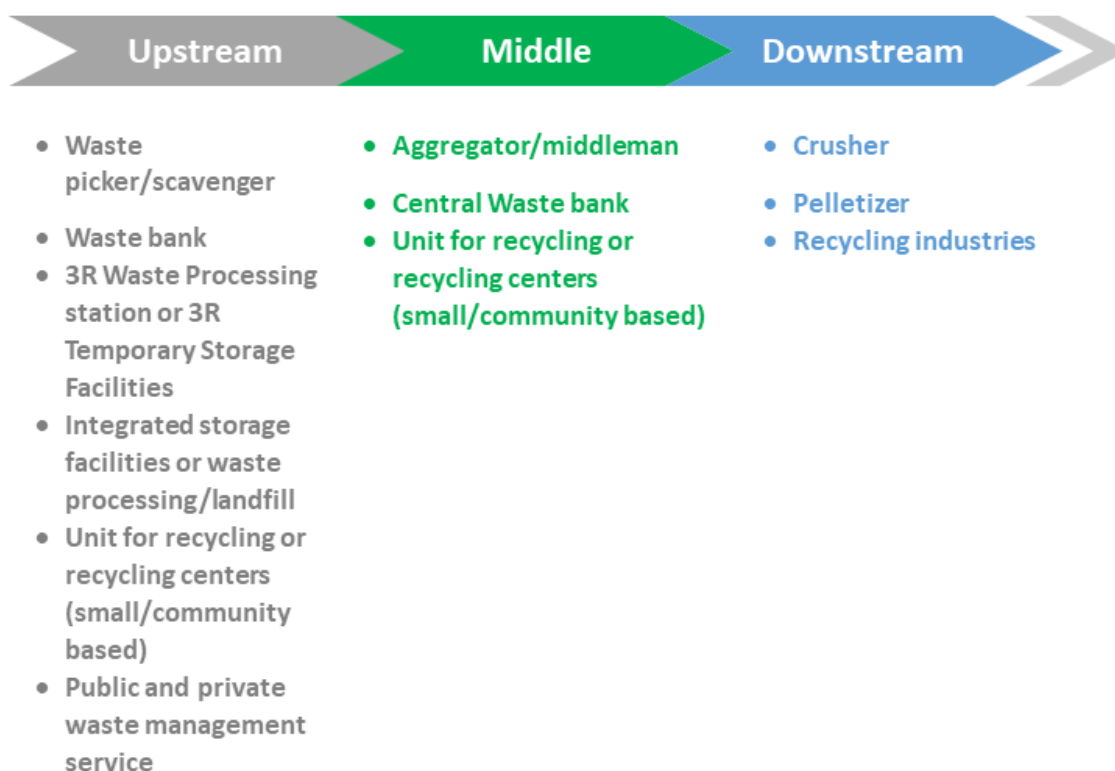


Figure 2 Actors along the plastic shopping bags Waste Value Chain

5. Plastic Waste Collection Rate

The results of the Domestic Paper and Plastic Recycling Study conducted by the Ministry of Environment and Forestry in 2021 showed that in 2019, the plastic recycling rate for Java Island was at ±0.421 million tons per year. To achieve this figure, the role of actors in the upstream segment is very important.

The same study shows that actors in the upstream segment that have the highest recycling rate are scavengers, while in the middle segment are aggregators. More than 84% of plastic waste collected is contributed by scavengers (Figure 3). The high recycling rate of scavengers is caused by the work pattern of scavengers in collecting waste which is more flexible or can 'pick up the ball', compared to other actors which are relatively limited and stationary. Scavengers can collect waste door-to-door, at the Temporary Storage Facilities or at the Landfill. The majority of scavengers will sell their work to aggregators, so that the recycling rate of aggregators will also be high, while main waste banks generally only accept waste from waste bank units and Temporary Storage Facilities for Reduce, Reuse, and Recycle.

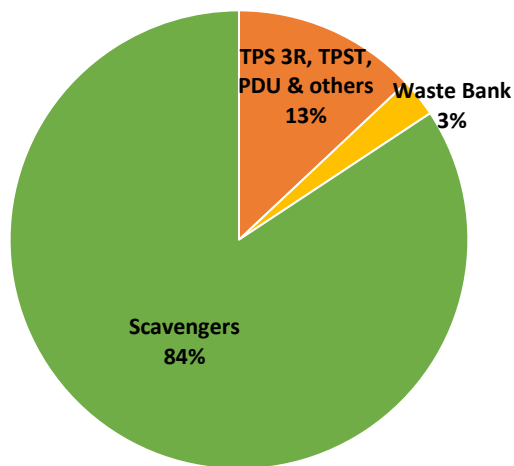


Figure 3 Contribution of Upstream Actor in Plastic Waste Collection in Java Island (Ministry of Environment and Forestry, 2021)

If you look at the proportion of plastic waste that has accumulated in aggregators operating on the island of Java, it can be seen that plastic shopping bags (HDPE-film) occupies the second largest proportion of all types of plastic collected; with a percentage that is not too much different from the PET bottle which occupies the first position.

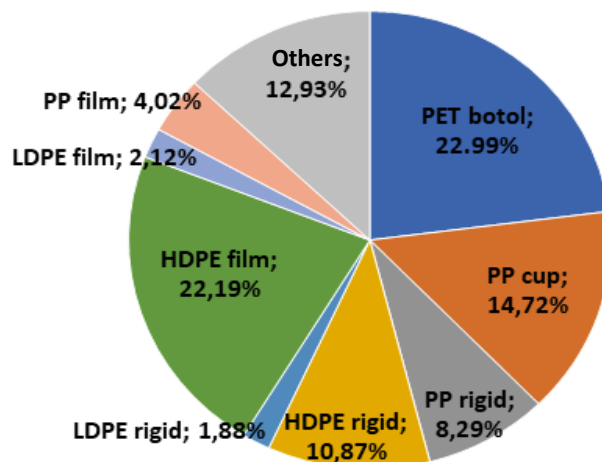


Figure 4 Composition of Plastic Waste Collected by Aggregators in Java Island (Ministry of Environment and Forestry, 2021)

Information on the level of potential for plastic recycling and the composition of waste in the aggregators shows that plastic shopping bags waste management has a high potential for development. Completely eliminating the circulation of plastic shopping bags can disrupt the economy of the actors involved in it, as well as not guaranteeing a reduction in the issue of plastic waste in the environment.

Therefore, what is needed is an effort to optimize management starting from product design and production to increasing management efforts in the end-of-life phase. This management

also includes encouraging the recycling process and building an enabling environment that can support the recycling process from both supply and demand sides.

6. Recommendation

Reflecting on the above aspects, the recommended strategic and tactical steps related to the context of this plastic shopping bags are:

- Considering the high absorption of plastic waste by the recycling plastic shopping bags industry, it is necessary to consider 'exclude' shopping bags made from recycled materials from banning and excise. Not only reducing the potential for disruption to the plastic shopping bags value chain and plastic shopping bags waste, but this exclusion measure will also contribute to the creation of a circular economy.
- Recycled plastic bags also have Indonesian National Standard (SNI) Ecolabel 7188:11 – 2018. Actors within the recycling plastic shopping bags industry may be required to obtain this SNI. Producers whose products have received this ecolabel should have given guarantees that their production processes have prioritized environmentally friendly principles.
- Provide drop boxes or plastic shopping bags collection containers (which can be recycled) in shopping centers, supermarkets, and traditional markets. The existence of this drop box can increase the rate of plastic shopping bags waste collection, which in turn will increase the raw materials supplied to the plastic shopping bags recycling industry.
- Collaborate with the Main Waste Bank or Waste Bank Unit for the plastic shopping bags collection process
- Improve the waste management system at the district/city level, especially for waste collection activities. The low level of waste collection services at the household level is often the cause of wasting plastic into the environment and causing pollution. Increasing the level of waste collection will certainly be able to reduce the level of waste leakage into the environment, as well as being useful in increasing the supply of raw materials to actors in the downstream segment of the plastic shopping bags waste value chain.
- Conducted a review of Minister of Environment Regulation number 75 of 2019 related to the phasing-out of several plastic materials that currently have a recycling chain, including plastic shopping bags (HDPE Film). Optimization of recycling is a more strategic step compared to phasing out these materials.
- Development of energy recovery -based municipal waste processing as an alternative for plastic shopping bags waste processing
- Encouraging waste processing into alternative solid fuels as an additional solution for processing plastic waste that is not absorbed by the recycling industry. This co-financing scheme for waste processing should also be developed to reduce the initial investment and operational burden of the system, especially considering that waste processing at the district/city level is often constrained by the weak financial capacity of local governments.

Imprint

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