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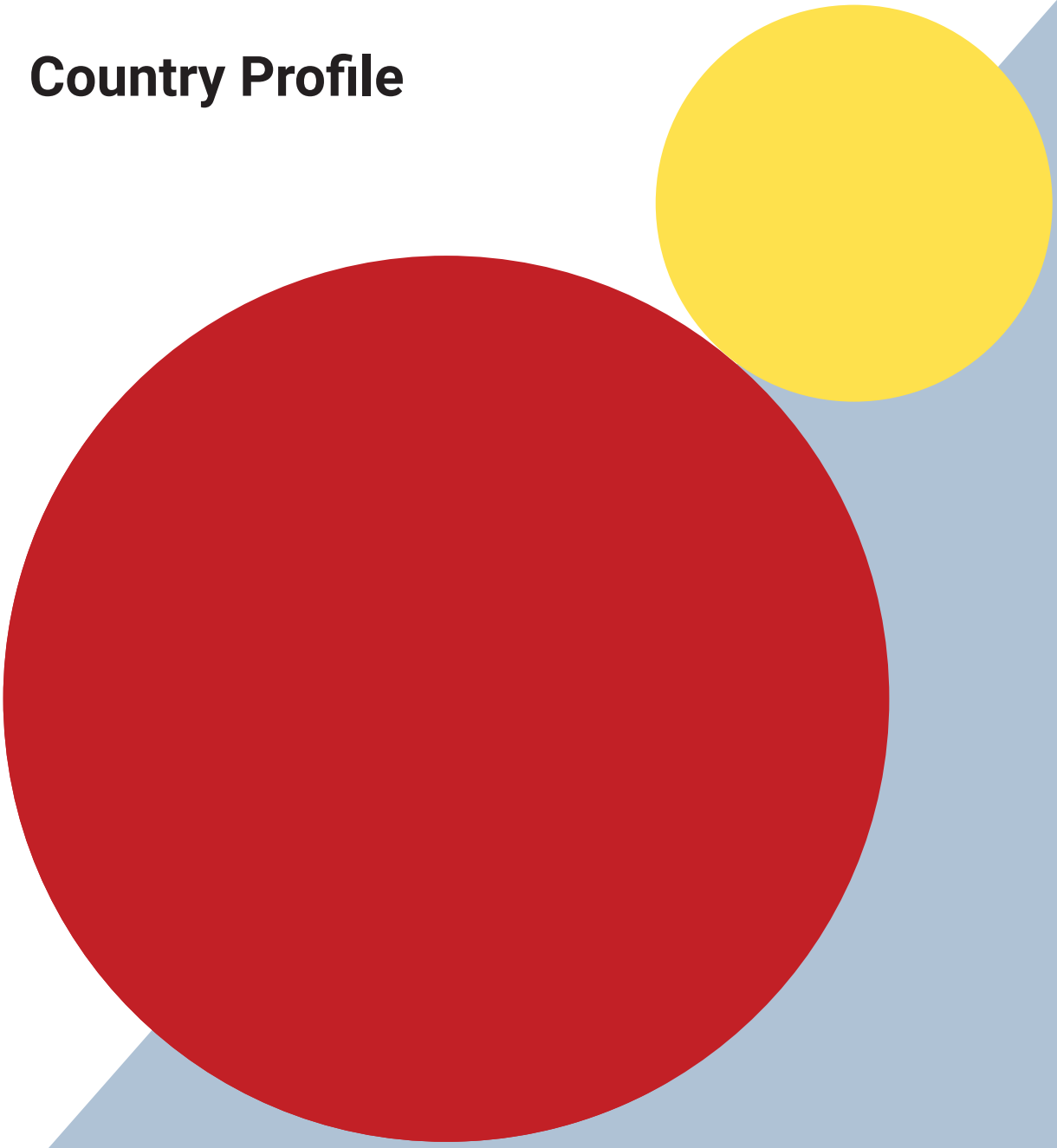
PLASTIC POLICIES IN INDONESIA

Country Profile



Acknowledgements

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Abbreviations

CMMAI	Coordinating Ministry of Maritime Affairs and Investment
EPR	Extended Producer Responsibility
EU	European Union
FDI	Foreign Direct Investment
FMCG	Fast-Moving Consumer Goods
GPAP	Global Plastic Action Partnership
HDP	High-Density Polyethylene
MLP	Multi-Layered Plastic
MoEF	Ministry of Environment and Forestry
MoI	Ministry of Industry
MOT	Ministry of Trade
MWR	Market Wide Research
NPAP	National Plastic Action Partnership
SME	Small and Medium-sized Enterprises
SUP	Single-Use Plastic
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
USD	United States Dollar
VAT	Value-Added Tax
WEF	World Economic Forum
WRI	World Resources Institute

1. Context

In Indonesia, more than 4.220 million tonnes of plastic waste were generated in 2023, or 15.3 kg per capita (EA 2024). This is slightly less than the global average of almost 32 kg per capita per year and one quarter below the average in SWITCH-Asia Countries of roughly 20 kg per capita per year (EA 2024) (Figure 1).

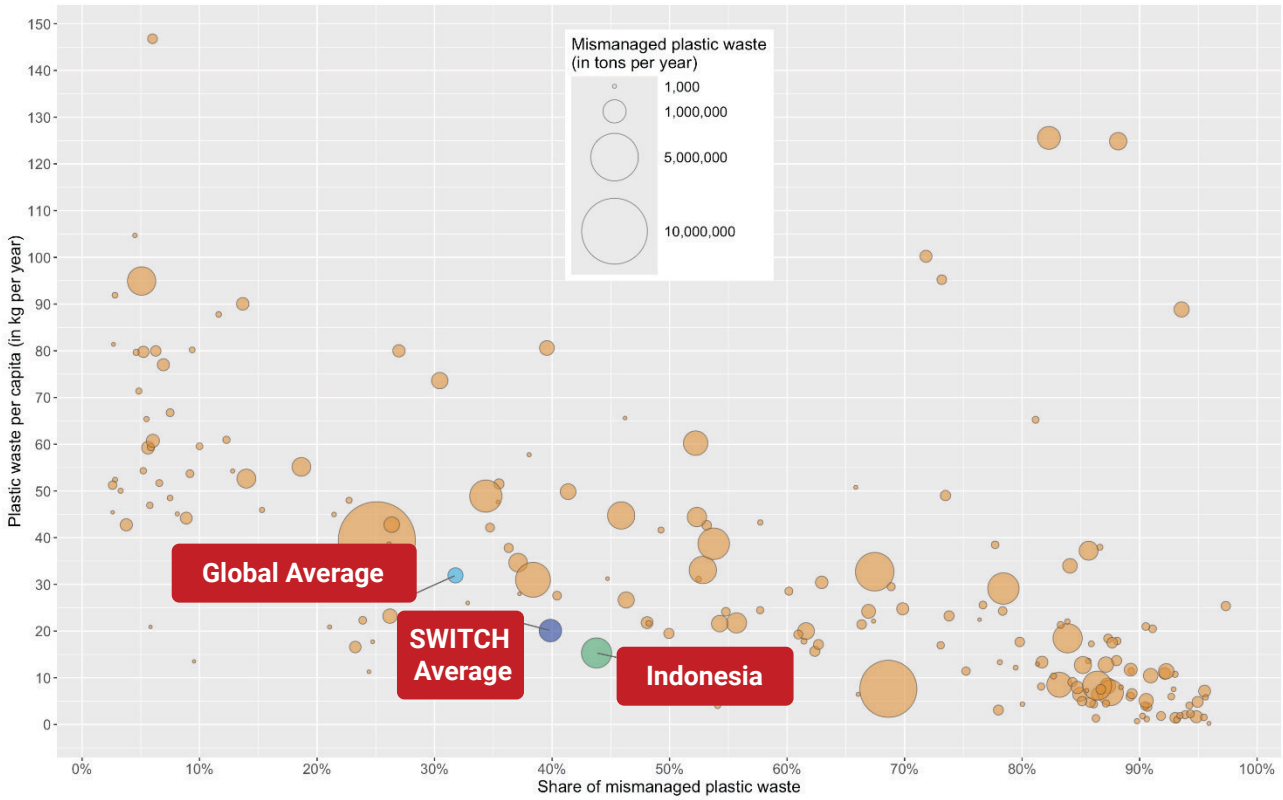

Figure 1. Plastic waste in Indonesia in 2023

Source: Earth Action 2024 data

With 1.848 million tonnes of mismanaged plastic waste, Indonesia is the country with the eighth-highest total amount of mismanaged plastic waste in the world (EA 2024). The share of mismanaged plastic waste stands at 44%, and thus 12 percentage points higher than the global average and 4 percentage points higher than the average share in SWITCH-Asia countries. A study by Lebreton and colleagues (2017) found Indonesia to be a significant contributor to plastic pollution in Asia, with four Javanese rivers – Brantas, Solo, Serayu, and Progo – transporting substantial amounts of plastic annually into the ocean: 38,900, 32,500, 17,100, and 12,800 tonnes, respectively. In all, Indonesian rivers and streams, primarily from Java and Sumatra, emitted an estimated 200,000 tonnes of plastic per year, accounting for an estimated 14.2% of the global emissions from rivers into the oceans. This high emission rate was attributed to the region's population density and poor waste management practices. The Ministry of Environment and Forestry (MoEF) refers to a study from 2015 that found Indonesia to be the second largest contributor to plastic pollution in the marine environment, after China (MoEF 2020, Jambeck 2015). In addition, imports of plastic waste reached 201,000 tonnes in 2022, the first rise since a steady decrease in previous years, after an all-time high of 332,000 tonnes in 2018, which happened in the context of the Chinese ban on plastic waste imports (UNCTAD data). As result, Indonesia was the country with the thirteenth-highest level of imported plastic waste in 2022. Indonesia faces significant challenges with transboundary marine waste, which contributes to the plastic pollution along its shores. Estimates suggest that up to nearly 600,000 tonnes of marine plastic debris are present in Indonesian waters annually, with a sizeable amount originating from neighbouring countries due to ocean currents.

Rank of Indonesia in global comparison (out of 192, 192 being the highest)	
Plastic waste in metric tonnes	**184**
Plastic waste per capita (kg/year)	**68**
Mismanaged plastic waste in metric tonnes	**185**
Mismanaged plastic waste per capita (kg/year)	**77**
Share of mismanaged plastic waste	**68**

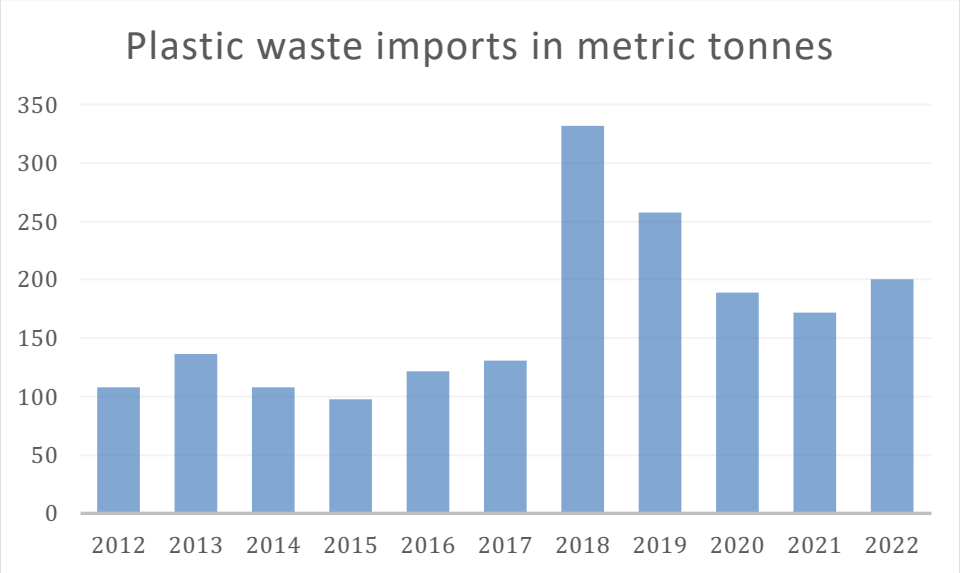

Figure 2. Imports of plastic waste in Indonesia 2012 - 2022

Source: UNCTAD data

The plastic industry in Indonesia plays a pivotal role in the country's economy, driven by several key factors and sectors. The plastic industry in Indonesia is bolstered by continuous economic growth, added use cases, and an expanding consumer base. In 2024, the country's plastic market size was 7.04 million tonnes. Estimates expect a compound annual growth rate (CAGR) of more than 4% until 2029, leading to a plastic production of 8.9 million tonnes in 2029 (Mordor Intelligence 2024). This expansion is driven by increasing urbanisation, a growing middle class with rising disposable income, and government initiatives aimed at promoting the industry as well as by demand in sectors such as packaging, construction, automotive, and consumer goods, further supported by the rise of e-commerce and modern retail formats. The packaging sector, in particular, is witnessing rapid growth due to its use of injection moulding and the increasing demand for efficient and attractive packaging solutions (MWR 2024). At the same time, environmental concerns related to plastic waste and emerging governmental policies aimed at phasing out single-use plastics (SUP) by 2029 are indicative of a potential slowdown in this growth trajectory. At the same time, the industry responds to this, for example with the development and production of 'environmentally friendly' plastic products (MWR 2024).

The Indonesian plastics industry is notably fragmented, characterised by a diverse range of companies operating across various segments such as packaging, construction, automotive, and consumer goods. Despite the presence of several major players like BASF SE, PT Lotte Chemical Titan Tbk, and PT Polychem Indonesia Tbk, the market remains competitive with numerous small and medium-sized enterprises contributing to the industry's dynamics (MWR 2024).

The market's fragmentation is further evidenced by the wide array of applications and technologies employed, ranging from simple plastics for everyday applications to highly specialised plastics for engineering purposes

and bioplastics, and from injection moulding to extrusion and blow moulding techniques. This diversity in products and processes underscores the competitive landscape, where companies continuously innovate and adapt to meet the evolving demands of various end-user industries (Mordor Intelligence 2024).

Plastic-related trade data corroborate the important role of the plastic industry for Indonesia's economy. Overall, in 2022, Indonesia's trade volume of plastic-related products and goods amounted to USD 37.9 billion, which is more than 7.1% of Indonesia's overall trade volume in products and 1.3% of the global plastic trade volume, according to UNCTAD data. Indonesia is a net exporter of final manufactured plastic goods, with a positive trade balance of almost USD 1.6 billion in 2022, as well as of plastic additives, with Indonesia exporting a volume of USD 6.1 billion, leading to a positive trade balance of nearly USD 4.4 billion (Figure 2). Indonesia is a net importer of all other plastic-related goods and products. Above all, Indonesia imports plastics in primary forms, but also and to a lesser extent, intermediate forms of plastic and intermediate manufactured plastic goods that together result a negative trade balance of US$ 9.8 billion and account for 44% of the country's plastic-related imports.

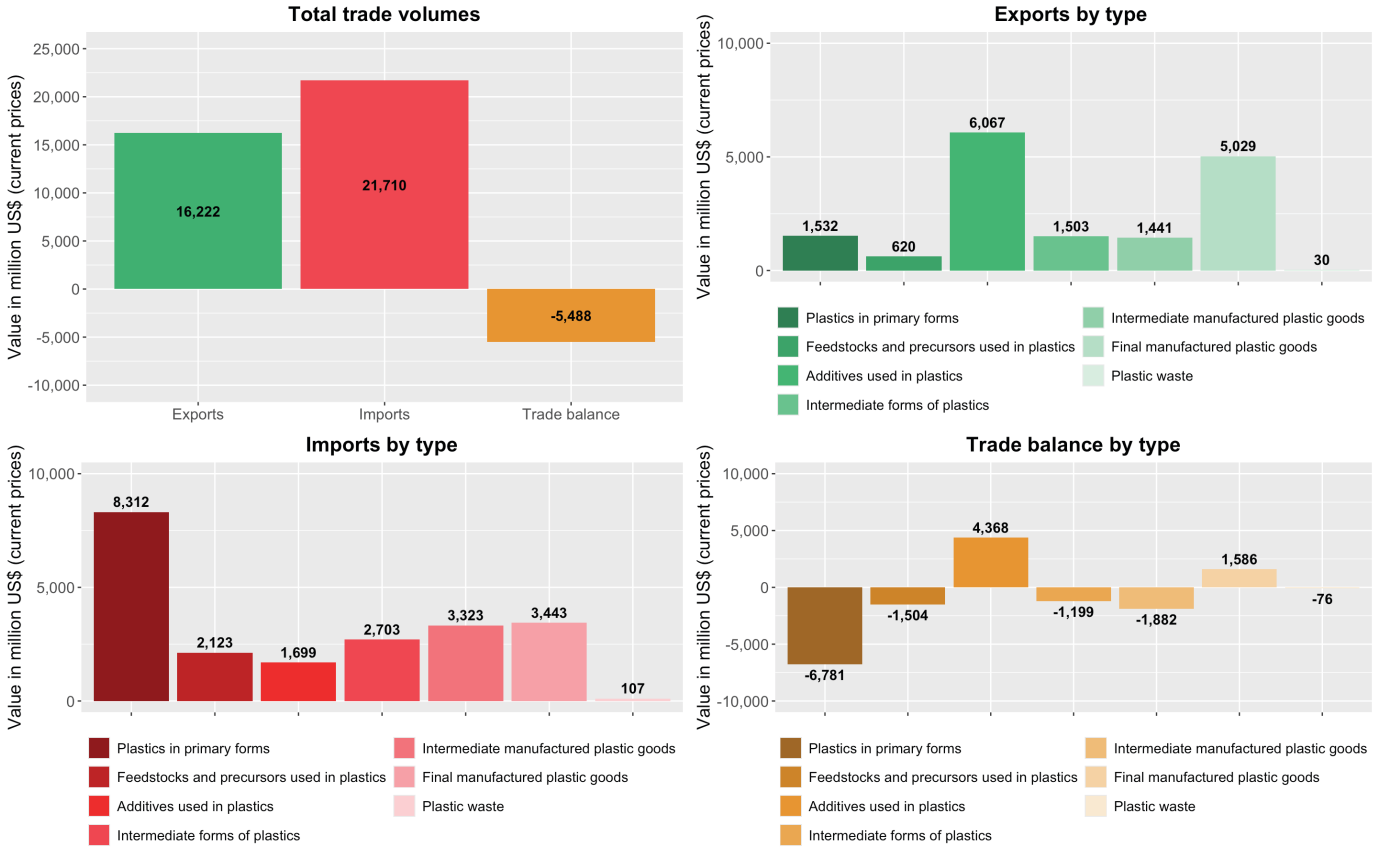

Figure 3. Plastic-related trade in Indonesia in 2022

Source: UNCTAD data

2. Policy landscape

Indonesia has enacted several national and subnational policies to combat plastic pollution. Most of these are concerned with municipal waste management aspects, and the earlier policies do not mention plastics specifically. However, several of these policies speak of reuse, reduce and recycling, which suggests that they are also directed at plastic. Key national policies include the following instruments.

2.1. Existing waste-focused regulations and plans

The **Solid Waste Management Act (No. 18/2008)** aims to improve overall waste management, in particular by prohibiting open dump sites. However, many open-dumping sites still operate today. Similarly, the Act already incentivised producers to use degradable, reusable, recyclable, or generally 'environmentally friendly' materials, and to practice reducing, reusing and recycling (3Rs), by proposing to sanction non-complying behaviour. In doing so, the Act specifically targets the production stage of the lifecycle of (plastic) products (Government of Indonesia 2008).

Government Decree No. 81/2012 on Waste Management of Household Waste and Household-Like Waste extends obligations to follow the 3Rs to consumers when managing their own waste. Following the 3Rs is further promoted through the establishment of so-called Waste Banks across the country. **Decree No. 13/2012** from the Ministry of Environment and Forestry (**MoEF**) lays out how these Waste Banks should operate: individuals can sell their recyclables for a pre-set price to the Waste Bank, which is then tasked with the organisation of further treatment of the waste. Two recent assessments found that the waste banks in Indonesia enhanced environmental quality by promoting environmentally sound disposal, by increasing recycling and reuse rates and by reducing waste ending up on landfills. In addition, they provided social and economic benefits, e.g. by increasing income for communities (Budiyarto et al. 2024; Miftahorrozi et al. 2022).

Waste Banks, or 'bank sampah'

An innovative approach to waste management that integrates community participation with financial incentives. These banks operate similarly to conventional banks but instead of depositing money, community members deposit recyclable waste. This waste is then weighed, assigned a monetary value, and recorded in the depositor's account. The accumulated value can be withdrawn as cash or used to purchase goods, thus providing a tangible incentive for waste segregation and recycling (Salim 2013).

Key Aspects of Waste Banks:

Community Participation: Waste banks are typically community-driven initiatives where local residents bring sorted waste to a designated collection point. This type of action fosters a sense of community responsibility and environmental stewardship.

Economic Value: The waste deposited is sold to recycling agents or factories, and the proceeds are credited to the depositor's account. This system not only promotes recycling but also provides an additional source of income for participants.

Government and Private Sector Involvement: The Indonesian government has been instrumental in promoting waste banks, with regulations such as the Republic of Indonesia Minister of Environment Regulation No. 13 of 2012 providing guidelines for their operation. The private sector also plays a crucial role, often through corporate social responsibility (CSR) initiatives.

In order to implement Decree No. 81/2012, **MoEF Regulation No. 6/2022** establishes a National Waste Management Information System to integrate and manage waste data from various sources. It mandates local governments to provide information on waste sources, generation, composition, characteristics, and management facilities. Data must be submitted at least twice a year. The system is used for public information and policy development, thus enhancing coordination and efficiency in waste management across Indonesia (Government of Indonesia 2022).

Finally, **Presidential Decree No. 97/2017** sets the roadmap for achieving a 'Clean-from-Waste' Indonesia by 2025, targeting a 30% reduction in overall waste generation and 70% in waste handling by 2025. Indicators include decreasing waste generation per capita, reducing waste at the source, and reducing waste leakage to the environment. The decree also aims to increase the treatment of waste through recycling, composting, biogas, and thermal recovery, and to reduce the amount of waste sent to landfills. This Decree is the most far-reaching of the existing waste management regulations to have been established since 2012 (Government of Indonesia 2017).

The Decree is supported by **Indonesia's Plan of Action on Marine Plastic Debris 2017–2025**, enacted through **Presidential Regulation No. 83/2018**, which outlines three important aspects of combating, in particular, plastic pollution in the marine environment, namely through inter-ministerial coordination on waste management; using technology; and societal efforts in reducing, recycling and reusing (3Rs) from a young age. The Action Plan furthermore outlines five pillars of action, as follows:

1. **Behavioural change through awareness raising**
2. **Reduction of land-based leakage through**
    a. waste-into-energy conversion
    b. a plastic bag fee
    c. use of plastic debris as asphalt mix for road construction
3. **Reduction of sea-based leakage through**
    a. monitoring and collection of marine plastic waste
    b. awareness raising
    c. improving facilities for waste management in ports, on small islands and in coastal areas
4. **Reducing plastic production and use** by encouraging manufacturers to shift towards biodegradable plastics and recycled materials
5. **Enhancing governance**, including financial aspects, policies and enforcement of existing and upcoming regulations by
    a. tapping into international sources of funding, including from international organisations and partner countries
    b. increasing inter-ministerial cooperation and collaborations with non-governmental stakeholders to develop waste management standards
    c. increasing waste management infrastructure. (Government of Indonesia 2018)

While the Plan advocates for a shift to biodegradable plastics, especially those that biodegrade in a marine environment, no such plastics have been developed within the country to date. With its access to renewable resources like plant oils and sugars Indonesia has a great potential to produce such plastics. In doing so, it can draw on already existing approaches and products to produce such biodegradable plastics elsewhere. Further measures include plastic bag charges and river clean-up projects like the Citarum River initiative. However, the plan lacks detailed actions on basic waste collection services. Innovations such as using plastic for asphalt roads are emerging although they are contested, due to fears that through abrasion, pollution through microplastics is merely delayed but not prevented (March et al. 2022).

2.2. National Roadmap and Action Plan Circular Economy Indonesia 2025 – 2045

In July 2024, the Indonesian government launched its **National Roadmap and Action Plan Circular Economy Indonesia 2025 – 2045** (Republic of Indonesia 2024). In this strategy, the government identifies plastic packaging in the retail sector as one of five priority sectors for the implementation of the circular economy in Indonesia.

The roadmap for implementing circular economy in the retail sector distinguishes four main milestones.

1. **Between 2025 and 2029:** Ecosystems for redesign, reuse and collection of packaging waste are developed.
2. **Between 2030 and 2034:** Environmentally friendly procurement of products, implementation of reuse systems, and management of plastic packaging waste is accelerated.
3. **Between 2035 and 2039:** Systems for reuse, redesign and plastic packaging waste management are implemented.
4. **Between 2040 and 2045:** A sustainable and integrated management system of plastic packaging is implemented.

To achieve these milestones, four distinct strategies were formulated, each resting on one or several specific action plans that define objectives, indicators, baseline data, specific milestones and key lead actors.

- **Strategy 1:** Redesign plastic packaging and increase recycled content
- **Strategy 2:** Manage packaging from bioplastic
- **Strategy 3:** Develop reusable packaging system
- **Strategy 4:** Enhance collection, recycling and recovery of plastic packaging

Table 1 shows the action plans for each strategy, their basic objectives and specific targets for 2045 (or the latest year when the target must be achieved).

In addition, the **National Roadmap and Action Plan Circular Economy Indonesia 2025 – 2045** spells out which of the 9R guiding principles it applies to plastic packaging in the retail sector, how and in which stage of the value chain (Table 2). The 9R stands for Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, and Recover.

Table 1. Overview on strategies, action plans, objectives and specific targets for plastic packaging in the retail sector in the National Roadmap and Action Plan Circular Economy Indonesia 2025 – 2045.

Source: Authors' compilation from Republic of Indonesia 2024

Action Plan	Objectives	Specific Targets
Strategy 1		
Redesign of low-economic-value plastic packaging	Increase the economic value of plastic packaging by a) shifting from multi- to mono-material plastic packaging and b) from low- to high-value plastic packaging	By 2045: 100% production share of high-value plastic packaging and 0% of low-value plastic packaging (Polyvinyl Chloride, PVC, and Polystyrene, PS)
	Reduce waste generation by through redesign that avoids unnecessary packaging components	By 2045: Recycling rate for High Density Polyethylene (HDPE) at 16%, for Low Density Polyethylene (LDPE) at 7%, for Polyethylene (PET) at 65% and for Polypropylene (PP) at 25%
Increasing the recycled content in plastic packaging	Increase the recycled content in HDPE, LDPE, PET, and PP plastic packaging.	By 2045: recycled content rate at 50%
	Provide supporting systems to increase recycled content in plastic packaging by including it in green public procurement requirements and developing standards for determining recycled content	• By 2034: there is a standard for determining recycled content • By 2045: 50% of all plastic packaging available in in National Public Procurement Agency of Goods/Services Electronic Catalogue have ecolabels
Strategy 2		
Provision of support systems for the management of bioplastic packaging waste	Providing clear information to consumers, waste collectors, and recyclers to properly sort bioplastic packaging waste and ensure proper management.	• By 2029: Roadmap for Plastic Packaging Development and Management is available • By 2029: baseline studies and target milestones for facilities for post-consumption bioplastic packaging processing are available • By 2029: baseline studies and target milestones for bioplastic development and the implementation of a traceability system for the bioplastic value chain are available • By 2034: technical standards for managing plastic waste are available
Strategy 3		
Enhancement of Providers & Refill Facilities for Personal Care & Cosmetics Products	Reduce single-use plastic packaging waste by a) increasing availability of refill systems, b) expanding verified refill station facilities, and c) decreasing the generation of single-use plastic packaging waste	• By 2029: presence of related technical directives • By 2045: 6.500 refill facilities, 40% of products suitable for reuse systems, and 434 tons of single-use plastic packaging waste are avoided

Action Plan	Objectives	Specific Targets
Enhancement of Reusable Packaging for Home Care, Food, and Beverage Products	Reduce single-use plastic packaging waste by a) detailing supporting systems, implementation targets, and reduction goals for plastic packaging waste, b) increasing availability of products for reuse systems, c) expanding verified refill station facilities, and d) decreasing the generation of single-use plastic packaging waste	• By 2029: technical standards for reverse logistics • By 2034: presence of reuse regulations • By 2045: 5.000 refill facilities, 30% of products suitable for reuse systems, 89 tons of single-use plastic packaging waste are avoided, and 416 districts, 98 cities and 38 provinces are conducting outreach on reuse systems
Strategy 4		
Strengthening EPR schemes in manufacturing, food and beverage services, and retail	Enhancing the implementation of EPR for plastic packaging by involving various stakeholders	• By 2029: a) milestone target study for manufacturers, food and beverage services, and retailers with EPR implementation roadmaps, b) milestone target study for manufacturers, food and beverage services, and retailers reporting waste reduction efforts, c) publication for producers who reported EPR, d) baseline study and target setting for programs implemented by EPR funds managed by the Producer Responsibility Organization (PRO) • By 2034: adoption of follow-up regulations to Permen LHK 75/2019 • By 2045: 1.000 companies receiving outreach (coaching clinics) from the government
Enhancing collaboration for integrated waste collection	Improving waste collection performance through collaboration between the government, private sector, and informal sector	By 2029: baseline study and milestone target setting of a) percentage rate of plastic packaging waste collection from the source to sorting and processing facilities, and b) number of SMEs/ micro-enterprises/ informal sector entities facilitated to support integration into the business ecosystem of large companies
Increasing plastic recycling facilities	Increasing the recycling rate of plastic packaging by a) expanding recycling facilities and b) optimizing support systems for plastic packaging recycling through the establishment of minimum prices for recycled plastic materials	By 2045: a) 148 recycling plants spread across 10 provinces, and b) 54% recycling rate of plastic packaging
Expanding off-takers for products generated by Waste-to-Energy	Increasing material recovery from plastic packaging by a) expanding the number of material recovery facilities and b) strengthening cooperation with off-takers	• By 2029: baseline study and milestone target setting for off-takers cooperating with Waste-to-Energy facilities • By 2045: 52 facilities for material recovery from plastic into fuel/energy (oil, refuse derived fuel, gas, electricity), and b) 3% recycling rate of plastic waste recovery through Waste-to-Energy processing

Table 2. Summary of 9R principles in the National Roadmap and Action Plan Circular Economy Indonesia 2025 – 2045.

Source: Authors' compilation from Republic of Indonesia 2024

	Production	Distribution	Marketing	Consumption	Collection	Recycling
Refuse: Avoiding redundancy in product manufacturing by delegating the functions of products or offering the same functions using different products	• Removal of labels and plastic seals from commercial bottled drinking water packaging • Innovation in enhancing the durability of long-lasting plastic packaging for reusable containers	Avoiding the use of single-use packaging	Provision of refill stations/ bulk stores	Use of tumblers, bamboo/ stainless straws, reusable bags		
Rethink: Using products more intensively		Marketing business to business (B2B) commodities that have already implemented a reuse system	Using reusable containers for refill stations	• Manufacturers/ distributors collecting and reusing packaging that has been used by consumers • Provision of reusable containers by canteens/ catering services at schools, food courts, and companies	Implementation of separated and scheduled waste collection	
Reduce: Increasing production efficiency by using fewer materials	• Using less plastic material in the production process • Innovation in material efficiency, minimal input maximum output					
Reuse: Reusing products that are still usable	Provision of product packaging that can be refilled by consumers			Purchasing products at bulk stores/ refill providers using reusable containers		

	Production	Distribution	Marketing	Consumption	Collection	Recycling
Repair: Repairing damaged products						
Remanufacture: Restoring products, typically older products, to make them functional again						
Refurbish: Using parts of old products that are no longer functional in new products with the same function						
Repurpose: Using parts of old products that are no longer functional in new products with a different function				Reusing plastic for different functions, without processing		
Recycle: Processing materials to produce the same material (with the same or lower quality)	• Use of secondary raw materials in the production of plastic packaging products • Use of secondary raw materials in the production of other commodity products		Provision of take-back programs for used plastic packaging from consumers (EPR)		Collaboration with the informal sector to accelerate waste collection	• Recycling plastic packaging into secondary raw materials • Recycling plastic packaging into raw materials for other products
Recover: The process of converting materials to extract energy						Recovery of materials from plastic packaging

2.3. Market-based mechanisms

MoEF Decree No. P.75/2019 (Roadmap to Waste Reduction by Producers) assigns responsibilities for preventing, reducing and managing plastic waste to producers. It encourages producers to develop waste-reduction strategies in three major action areas:

1. **Waste Prevention and Reduction** by encouraging sustainable product and packaging design, phasing out single-use plastics, eliminating excessive packaging, enhancing recyclability and reusability, incorporating more recycled content, and producing durable, returnable, rechargeable, and refillable goods
2. **Reuse** by implementing systems to take back post-consumer products and packaging for reuse
3. **Recycling** by establishing mechanisms to take back post-consumer products and packaging for recycling. (Government of Indonesia 2019)

Moreover, the Decree outlines five stages that producers can follow: planning, implementation, monitoring, evaluation, and reporting.

The authority responsible for overseeing these efforts is somewhat unclear. In the first place, regional governors and mayors are to receive reports on these activities as part of their supervisory duties. However, Article 19 of the decree states that if the governors or mayors fail to conduct the required monitoring, the national minister will assume supervisory authority. This provision may impair regional engagement and oversight, which is, however, typically the adequate level for effective enforcement of producer responsibilities. Therefore, despite this progressive step towards involving business actors in effective waste management, the assignment of supervisory responsibilities should avoid such potential loopholes and focus on regional authorities in order to facilitate effective monitoring and implementation of producer responsibility (Maskun et al. 2023).

Overall, the decree appears to be a soft policy instrument relying on the producers' voluntary engagement and commitment. It can therefore hardly be compared to the mandatory EPR schemes that exist in other countries. The decree neither obliges producers to take actions or to pay for the end-of-life management of their products, nor does it set specific quotas for collection or recycling. The National Roadmap and Action Plan Circular Economy Indonesia 2025 – 2045 reports that 27 companies from the plastic sector submitted a roadmap, of which 8 also started the implementation, and that overall slightly more than 16.000 tons of plastic waste were collected under this system between 2020 and 2023 (Republic of Indonesia 2024). It acknowledges that the EPR implementation needs to be strengthened.

In early 2020, the Indonesian Government had prepared a law that would have implemented an **excise tax on several plastic (and other) products** (initially just bags, but the application was broadened to other products after a request by Parliament; Diela 2020). In 2022, the Indonesian government decided to delay the implementation of the plastic excise tax because of economic uncertainties (Masitoh 2022). Even when implementation will eventually be reintroduced, the design of the initiative could be adapted to improve how it will affect waste management. First, the excise tax should be modelled according to the harmfulness of the particular plastic or product (eco-modulation), in order to guide consumers towards purchasing less harmful products. Second, the revenues the tax generates should be earmarked to benefit waste management measures or infrastructure. As such, the excise tax will then specifically disincentivise the more harmful plastic products, while generating resources for improvements in waste management.

2.4. Trade-related mechanisms

Permendag No. 83/2020 outlines specific regulations regarding the import of plastic waste into Indonesia (Government of Indonesia 2020):

1. The importation of plastic waste must be conducted by an importer who holds an Importer License from the Ministry of Trade (MOT).

2. The imported plastic waste must be used directly by the importer and cannot be distributed to other companies.
3. The importer must already have operational facilities.
4. The domestic scrap plastic product of the importer must be the final product.
5. Every non-hazardous waste importer must provide a letter of statement from the exporter to ensure that the non-hazardous waste being imported is not hazardous waste.
6. Pre-shipment inspection, conducted only by surveyors authorised by the MOT, must be conducted at the place of origin, and the inspection report must be submitted to the MOT. Before obtaining the importation permit from MOT, the importer must also obtain recommendations from the Ministry of Environment and Forestry (MOEF) and the Ministry of Industry (MOI).
7. Plastic scrap allowed for import must meet the following conditions:
    a. It is not generated from landfill activities.
    b. It is not mixed with other waste.
    c. It is not contaminated with hazardous material or waste.
    d. It is homogeneous.

These regulations aim to ensure that imported plastic waste is managed responsibly and in compliance with environmental standards, preventing contamination and improper disposal. However, they do not ban or severely restrict plastic waste imports, as is practiced in other countries in the region which had previously become alternative markets for plastic waste after the Chinese ban on imports of plastic waste in 2018 (see Parker 2018).

Furthermore, there remain significant differences in criminal sanctions for waste importation into Indonesia that are highlighted in the Ministry of Trade Regulation Number 31 of 2016 (MTR 31/2016). This regulation requires that if imported non-hazardous waste contains hazardous materials, the importer must repatriate the waste within 90 days. Failure to do so results in a 30-day suspension of the import license, which can be reinstated only after compliance. This creates a regulatory inconsistency, conflicting with the norms in Law 18/2008 and creating a loophole for plastic waste imports. As a Basel Convention member, Indonesia must reform its laws to better monitor the environmental and human rights impact of imported waste, adhering to the Convention's strict standards and ensuring clear oversight and well-defined norms for effective implementation (Maskun et al 2023).

Table 3. Overview of plastic-related policies in Indonesia

Source: Authors' own representation

	Production (primary polymers)	Manufacturing (plastic products)	Consumption	Waste management/ End-of-life	Trade
COMMAND AND CONTROL					
Mandatory performance/outcome standards (incl. targets)					
Mandatory process standards (incl. targets)		Solid Waste Management Act (No. 18/2008)		Solid Waste Management Act (No. 18/2008)	• MTR 31/2016 • Permendag No. 83/2020
Technological standards (incl. targets)					
Prohibitions/bans (incl. phaseout)		Regional: several plastic bag bans			Solid Waste Management Act (No. 18/2008)
MARKET-BASED					
Taxes/levies		Planned but delayed: excise for plastic products			
Subsidies/grants/tax reductions					
Public procurement					
EPR/deposit refund schemes				• MoEF Decree No. P.75/2019 (EPR) • MoEF Decree No. 13/2012 (Waste Banks)	
Liability schemes					
INFORMATION					
Taxonomies					
Data collection, reporting and disclosure				MoEF Regulation No. 6/2022	

	Production (primary polymers)	Manufacturing (plastic products)	Consumption	Waste management/ End-of-life	Trade
Labels					
Awareness raising/ capacity development				Multiple awareness raising campaigns	
GOVERNANCE/COORDINATION					
Roadmaps, plans and strategies			Presidential Decree No. 97/2017 (JAKSTRANAS)	Presidential Decree No. 97/2017 (JAKSTRANAS)	
Inter-ministerial coordination	**Presidential Regulation No. 83/2018 on Marine Debris Management (National Plan of Action on Marine Plastic Debris)** sets different obligations for the Ministries of industry, maritime affairs and fisheries, environment and forestry, transportation, public works and housing and others. Together with the fact that increased inter-ministerial cooperation is a specific strategy of the Plan, this suggests that the government acknowledges the relevance of such cooperation in the fight against plastic pollution. How well the different ministries and agencies work together has not been assessed.				
Public-Private partnerships	One significant PPP is the collaboration between the Indonesia National Plastic Action Partnership (NPAP), the Coordinating Ministry of Maritime Affairs and Investment (CMMAI), and the World Resources Institute Indonesia as part of the of the multi-stakeholder initiative Global Plastic Action Partnership (GPAP), an initiative of the World Economic Forum (WEF).				
SPECIAL FOCUS SECTOR: BUILDING AND HOUSEHOLD APPLIANCES					
	While there are no policies that tackle plastic pollution reduction in the building sector, the World Resources Institute (WRI) Indonesia, in collaboration with the Indonesia National Plastic Action Partnership (NPAP), has highlighted several innovative projects that focus on reducing plastic waste and promoting sustainable practices. For example, the MLP Collection for Green and Affordable Housing Project leverages digital apps to collect low-value multi-layered plastic (MLP) and transform it into affordable building materials. This initiative not only addresses plastic pollution but also provides sustainable building solutions.				

3. Private sector innovations

The efforts that are described here underscore the importance of collaboration among the private sector, government, and civil society in addressing plastic pollution. By leveraging innovation and sustainable practices, Indonesia is making strides towards reducing plastic waste and promoting a circular economy.

3.1 Participation in Waste Banks

The private sector's involvement in waste banks is multifaceted, ranging from funding and technical support to active participation in waste management programmes. Notable examples include:

1. **Unilever Indonesia Foundation:** This foundation has fostered multiple waste banks across Indonesia, providing initial training, monitoring, and evaluation to ensure sustainable operations. Unilever's support has enabled waste banks to achieve monthly turnovers ranging from IDR 1–10 million or 61 to 610 Euros (Bahraini 2020).
2. **Waste4Change:** This organisation supports community empowerment through training and mentoring programmes aimed at optimising waste management. Their Community-Based Implementation service collaborates with various stakeholders, including companies looking to implement effective Corporate Social Responsibility programmes. Examples include the *TPS 3R Waste Management Optimisation Programme* with DOW Indonesia and the EcoRanger team initiative with Coca-Cola Indonesia (Bahraini 2020).
3. **Local Initiatives and Partnerships:** Waste banks like Lintas Winongo in Yogyakarta, supported by Unilever, showcase how private sector partnerships can enhance waste management efforts. These collaborations often involve financial and material support, mentoring, and participation in competitions that promote environmental sustainability (Ni'mah and Keller-Bischoff 2020).

While Indonesian waste banks are a testament to the power of community-driven initiatives supported by strategic partnerships with the private sector, they face challenges such as the need for better communication and community engagement, especially in rural areas. At the same time, they offer no incentive to reduce the overall production of plastic waste.

3.2 Indonesian National Plastic Action Partnership (WEF)

The National Plastic Action Partnership (NPAP) Indonesia has been set up as a local partner of the multi-stakeholder initiative Global Plastic Action Partnership (GPAP), an initiative of the World Economic Forum (WEF). Managed by the World Resources Initiative (WRI), NPAP Indonesia, with its 230 member organisations, was established in 2020 and is working towards reaching the Indonesian target of reducing marine plastic debris by 70% by 2025.

Regarding private sector innovation, the NPAP developed its own innovation roadmap that outlines a strategic approach to fostering innovation across the plastic value chain, emphasising the need for collective action and the cultivation of new solutions. The roadmap includes specific actions such as launching an innovation challenge, linking new ideas to accelerators and incubators, creating pre-competitive spaces for large producers and consumers, and identifying policy changes to encourage innovation. The Roadmap also maps solutions from NPAP members, who are engaged in various projects such as creating biodegradable plastics, recycling initiatives, and waste management solutions, like doubling plastic waste collection as well as building and expanding environmentally sound waste disposal facilities. Examples of these initiatives include Enviu's cassava-based biodegradable bioplastic, Danone Aqua's 100% recycled bottle, and Coca-Cola's Packaging Recovery Organisation. Moreover, the roadmap details priority actions like launching an innovation challenge, linking new ideas to accelerators and incubators, and creating pre-competitive spaces to improve demand signals for new innovations. The importance of providing support to innovators through financing, gaining access to critical resources, and linking these resources to key market players (Indonesia

NPAP 2021) are emphasised. Overall, the roadmap sets forth the objectives of the NPAP Innovation Task Force, which aims to map innovations, identify gaps and barriers, explore collaboration opportunities, and develop the necessary skills and capabilities in sustainable innovation, technology, market innovation, and supply chain management. An overview of the innovation ecosystem is provided, identifying five pivotal questions that guide their approach: driving R&D, understanding and validating innovation, providing technical support, accessing financing, and accelerating market introduction.

Another significant effort of the NPAP is their collaboration with the Coordinating Ministry of Maritime Affairs and Investment (CMMAI) as well as the World Resources Institute Indonesia, and an event to showcase innovative solutions for plastic waste management was held. Notable initiatives and innovative solutions are as follows:

- Repax, which provides returnable packaging for e-commerce
- TRADISI, which offers a digital platform for waste banks to foster community behaviour change
- Net Free Seas, which deals with abandoned fishing gear in the ocean
- RiverRecycle, which implements river-based waste collection systems while empowering local communities
- KIBUMI, which focuses on sourcing recyclable materials through technology
- MLP (Multi-layered plastics) Collection for Green and Affordable Housing Project, which transforms low-value plastic into building materials (WRI 2024).

Moreover, Indonesia's NPAP and UpLink have launched the Informal Plastic Collection Innovation Challenge to support the creation of new solutions for plastic waste reduction. This initiative aims to enhance the recognition of waste workers, improve digital literacy, and develop robust supply chains for recycling. The challenge seeks to address issues such as better waste management, increased recycling rates, and the promotion of a "circular economy for plastics" (Indonesia Water Portal 2021).

3.4 Other Private Initiatives

Private companies like Danone Indonesia have also made contributions, which in partnership with Veolia Indonesia is expanding its recycling capacity and building integrated waste management sites. The company is committed to recovering more plastics than it uses by 2025, focusing on collection, education, and innovation. Additionally, green start-ups like Rebricks are transforming rejected plastic waste into building materials. As of May 2022, Rebricks collected over 17 tons of plastic waste and processed it into construction material, namely high-quality paving blocks, concrete bricks, and vents for building (Republic of Indonesia 2024). Similarly, the Chandra Asri Group utilizes low-value plastic in the construction sector, namely as mixture to increase the stability of asphalt. As of July 2024 it has constructed more than 120 kilometres of roads with this material, thereby preventing more than 1,000 tons of plastic waste going to landfills (Republic of Indonesia 2024). Rekosistem is enhancing the waste value chain through digital platforms (Communications Desk 2021). From 2020 to 2022, alner avoided more than 160,000 single-use packages by establishing a deposit-return based system for returnable and reusable plastic packaging for consumer goods such as detergent, shampoo, and food products (Republic of Indonesia 2024).

4. Challenges

Indonesia faces a multifaceted challenge in addressing plastic pollution, exacerbated by its unique geographical and climatic conditions, extensive industrial activities, and varying degrees of policy enforcement capabilities.

Geographically, Indonesia is an archipelagic nation comprising over 17,000 islands, which presents a significant logistical challenge for waste management. The vast coastline, spanning approximately 99,083 kilometres, means that plastic waste generated on land and carried by rivers and streams often finds its way into the ocean. Major rivers such as the Citarum are being heavily polluted with plastic waste, contributing significantly to marine pollution. The dispersion of waste across numerous islands complicates centralised waste management efforts, making it difficult to implement uniform policies and practices across the country (World Bank 2021) and to benefit from economies of scale.

Climatic conditions further compound these challenges. Indonesia is prone to heavy rainfall and flooding, particularly during the monsoon season, which can exacerbate the spread of plastic waste. Floodwaters often carry plastic debris from urban areas into waterways and eventually into the ocean. Additionally, the tropical climate accelerates the degradation of plastic into microplastics, which are harder to collect and pose severe threats to marine and terrestrial ecosystems (World Bank 2021) and human health.

Industrial activities in Indonesia, particularly in urban centres like Jakarta, Surabaya, and Bandung, contribute significantly to plastic pollution. Rapid industrialisation and urbanisation have led to increased production and consumption of plastic products. The lack of adequate waste management infrastructure in many industrial areas means that a significant proportion of plastic waste is either improperly disposed of or ends up in informal waste management systems, which often involve open burning or dumping in rivers and oceans. The informal sector, while playing a crucial role in waste collection and recycling, often lacks the resources and technology to manage plastic waste sustainably and safely (Ismawati et al 2022).

In terms of recycling, Indonesia's informal waste workers focus primarily on retrieving high-value plastics, such as PET and HDP. Such post-consumer materials are later recycled through mechanical processing methods by numerous small and medium-sized enterprises (SMEs) in the plastic recycling industry. This means that the lower-value plastic waste, such as sachets or multi-layered packaging, is usually neither collected nor recycled.

As with many developing countries, policy enforcement capabilities in Indonesia are another critical aspect of the plastic pollution challenge. While the government has introduced various regulations aimed at reducing plastic waste, such as bans on single-use plastics in several regions along with initiatives to promote recycling, enforcement remains inconsistent in the country (Wang and Karasik 2022). Local governments often lack the resources and capacity to enforce these regulations effectively. Corruption and lack of political will can also hinder the implementation of policies. Furthermore, public awareness are still relatively low and habits of burning waste and a "throwaway culture" are difficult to overcome, which undermines the effectiveness of these policies (Jing and Sutikno 2021).

5. Way forward

Indonesia has enacted numerous policies aimed at reducing plastic waste, such as bans on single-use plastics and initiatives promoting recycling. The policies in the National Roadmap and Action Plan Circular Economy Indonesia 2025 – 2045 that address plastic packaging in the retail sector broaden this approach and include policies that cover the entire life-cycle of plastic packaging, which usually contributes the largest shares of plastic waste. While these policies have yet to be implemented and enforced, they are an important step towards effective plastics management.

Implementation and enforcement in general remains inconsistent in Indonesia as the result of resource constraints and lack of capacities. To address these issues, the government would need to prioritise the capacity of local authorities to enforce regulations and ensure consistent application across regions. Inter-ministerial coordination, as emphasised in the National Plan of Action on Marine Plastic Debris, should be strengthened to streamline efforts and avoid regulatory overlaps.

In terms of market-based measures, the government may consider revisiting the idea of a plastic excise tax, ensuring that it is designed to disincentivise the use of harmful plastics and that revenues are earmarked for waste management infrastructure. Additionally, value-added tax (VAT) exemptions for recyclers, as suggested by Ismawati and colleagues (2022) might be one option to promote the recycling industry. At the same time, the phase-out of harmful subsidies, such as tax exemptions for the petrochemical industry, could further promote recycling and sustainable practices (ibid.).

The current involvement and responsibility of producers for the management of their waste is largely voluntary and lacks stringent requirements for producers to manage the end of life cycle of their products. Establishing a legally binding EPR policy would compel producers to take responsibility for the collection, recycling, and disposal of plastic products. This could be complemented by setting specific quotas for collection and recycling, thus ensuring higher compliance and effectiveness.

For any advancements in Indonesia's waste management policies, including EPR policies and infrastructure developments, it would also be advisable to involve representatives of Indonesia's large informal waste sector. These workers largely rely on poorly regulated waste management structures and processes for their livelihoods. Regulation regarding improvements to waste management should ensure consideration for these workers.

In light of the fact that Indonesia's recycling industry seems to be overwhelmed with the amount of plastic waste to recycle, regulations and controls of plastic waste imports could be revisited to prevent the country from becoming a dumpsite for international waste. Following the policy approaches of the majority of its neighbours, Indonesia may want to consider a strict ban or at least a planned phase-out of plastic waste imports. This ban or phase-out could be complemented by measures that encourage the use of domestically generated recycled materials, thus ensuring that local recycling industries remain in business.

Additionally, the government could prioritise purchasing environmentally friendly goods through a green public procurement programme, similar to successful initiatives in Europe and Japan that have increased the market share of sustainable products (World Bank 2021b).

Investing in new technologies that can recycle plastics more efficiently and with lower environmental impact is crucial. The government could establish innovation hubs to develop and test new recycling technologies and sustainable materials. Supporting public-private partnerships, such as those involving the National Plastic Action Partnership (NPAP), can foster innovation across the plastic value chain. In this regard, Indonesia could profit from an increased sharing of innovation and technology, as it is currently foreseen in the Global Plastic Agreement.

Indonesia's waste bank efforts would best be accompanied by measures to increase public awareness about the consequences of plastic pollution and the importance of recycling so as to drive behavioural change. Educational campaigns could be set up, focusing on reducing plastic use, increasing plastic re-use, proper sorting of waste, and the benefits of recycling.

Lastly, continuous monitoring and evaluation of policy effectiveness can help adjust strategies in real time to ensure that the goals of reducing plastic pollution are met. This could include the collection of data on plastic waste generation, recycling rates, and policy compliance. Such data would also be needed in order to comply with the respective provisions of a Global Plastic Agreement.

Indonesia stands at a critical juncture where the rapid growth of its domestic plastic production, driven by multiplying use cases, including consumer goods and industrial demand, and profits, must be balanced with the pressing need for environmental sustainability. While sectors like packaging and consumer goods continue their expansion, emerging policies targeting single-use plastics, including through taxation, and growing environmental concerns signal a potential shift in trajectory. Industry actors must therefore prioritise innovation and the development and use of alternative materials and need to prepare to take responsibility for remaining plastic products, including through contributing to the needed waste management infrastructure.

How would the Global Plastics Treaty help? Through its provisions the treaty could:

- By enhancing capacities and strengthening regulatory framework through support for capacity-building initiatives and technical assistance
- By offering guidelines for the successful implementation of a legally binding and encompassing EPR system in India and elsewhere, thereby possibly setting a level playing field for producers but at least ensuring some minimum standards for EPR systems
- By providing funds for investments into waste management and by raising financial resources through its financial mechanism
- By enabling global cooperation with respect to a just transition for the informal waste sector
- By setting global rules and guidelines for the restriction of the plastic waste trade
- By fostering information exchange and technology transfer as well as international collaboration through the provisions on international cooperation
- By stimulating awareness-raising, education and research through provisions on these issues.
- By facilitating data collection through the provision on transparency, tracking, monitoring and labelling

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