

Plastic Waste Trade in Indonesia and Country's Response to Waste Trade Challenges



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Introduction

The term “waste colonialism” was first introduced by Puckett and Smith in their 2002 report titled “The digital dump: exporting high-tech re-use and abuse to Africa” (Puckett et al., 2002). They used the term to describe the practice of exporting hazardous electronic waste from developed countries to developing countries, particularly in Asia and Africa. Since then, the term has been widely adopted in academic and activist circles to describe the broader environmental and social impacts of waste disposal practices on marginalized communities. According to Liboiron (2021) the term “waste colonialism” highlights how pollution is not only a symptom of capitalism but a violent enactment of colonial land relations that claim access to indigenous land of local land (Liboiron, 2021).

The idea of “waste colonialism” draws on the historical and ongoing legacies of colonialism, which saw colonial powers exploiting the resources and labor of colonized countries for their own benefit. Waste colonialism reflects similar patterns of domination and exploitation, where developed countries continue to dump their waste in developing countries, often for little or no financial benefit to the receiving countries. In the last 30 years, waste colonialism has become a term widely adopted by scholars, activists, and policy-makers to describe the unequal and exploitative distribution of waste in the global context, where wealthy countries in the developed world send their waste materials, particularly plastic waste, to developing countries in Asia, Africa, and South America (Brooks et al., 2018; EEA, 2019; Foundation, 2023; Fuller et al., 2022; Michaelson, 2021; Pratt, 2011; Sridhar & Kumar, 2019). In many cases, these developing countries have weak or nonexistent regulatory

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oversight and waste management infrastructure and resources to properly dispose of this waste, leading to environmental pollution and public health risks.

Plastic waste colonialism occurs because recycling or disposing of plastic waste can be expensive, and some developed countries have found it more cost-effective to export their waste than to handle it domestically. Often, the waste is not adequately sorted or cleaned before it is shipped, leading to contamination and health risks for those managing it (OECD, 2018). Moreover, the lack of data and reporting makes identifying how many traded commodities were recycled difficult. In some cases, more than 40% of the content of items in the containers ended up in illegal dumping sites, being burned, and the chemicals in plastics contaminating the food chains (Karlsson et al., 2023; Petrlik et al., 2019, 2021).

The recipients of this waste are often countries that are already struggling with poverty and injustice, and they become the dumping ground for the waste of others. This type of colonialism perpetuates the power dynamic between developed and developing countries, with wealthy nations taking advantage of the resources and vulnerabilities of less-powerful nations (Marrs et al., 2019).

Waste colonialism has received greater attention in recent years with the implementation of waste import bans by countries such as China, Malaysia, the Philippines, and Thailand (Chen et al., 2021; Liang et al., 2020; Sasaki, 2020; Sembiring, 2019; Wang et al., 2019). These countries no longer accept plastic waste from developed countries, which has led to increased scrutiny of waste management practices and calls for greater responsibility from those who generate the waste.

Materials and Methods

We used data for plastic production, trade, and recycling taken from UN statistics (UN Comtrade Database) 2018–2022, state environmental bureaus or statistical bureaus, and reports published by several networks.

Of all the plastic products (code 39) in the HS (International Convention for Harmonized Commodity Description and Coding System, Harmonized System), code 3915 refers to plastic waste, parings, and scrap. Here plastic waste relates to the products belonging to code 3915 and other plastic products to commodities belonging to code 39 (3915: includes the value and quantity of plastic trade in this study).

We also obtained qualitative data and information from interviews with experts, relevant government officials, and focus group discussions with the Indonesian plastics and papers industry associations.

Results

Waste Trade Actors and Stakeholders

The actors involved in the plastic waste trade vary depending on the specific context but generally include the following:

- **Exporters:** These companies or individuals generate plastic waste and seek to dispose of it or sell it abroad. Exporters can include waste management companies, manufacturers, and retailers. Statistics and trade databases identify exporters based on countries where the companies are registered. Some importers have internal trade within the same group or between sister companies.
- **Importers and plastic recyclers:** These companies or individuals purchase plastic waste from exporters to process it into raw materials or for recycling purposes. Importers typically operate recycling facilities and may also export processed plastic waste. Plastic recyclers reprocess post-consumers' plastics and plastic wastes where it is washed, shredded, and sorted further. The plastic is then melted and extruded into new recycled plastic pellets to make new products.
- **Brokers and traders:** These intermediaries facilitate the buying and selling plastic waste between exporters and importers. Brokers and traders may be located in the same country as the exporter or the importer or may be based in a third country. Waste brokers and shipping lines also play a significant role in waste colonialism, particularly in the context of plastic waste trades. Waste brokers act as intermediaries between waste generators and waste processors or recyclers. They often operate in countries with weak regulatory systems and are known to engage in fraudulent activities, such as mislabeling waste shipments as recyclable materials. Waste brokers profit from the trade of plastic waste by charging fees for their services.
- **Shipping and logistics companies:** These companies provide transportation and logistics services to move plastic waste traded between exporting and importing countries. Shipping lines transport commodities from one country to another. They have been known to transport plastic waste under pretenses, such as labeling plastic waste shipments as "scrap plastic" or "recyclable materials." This mislabeling allows shipping lines to bypass regulations on the export of plastic waste and avoid paying higher fees for transporting hazardous waste. Shipping lines also made profits from the trade of plastic waste by charging fees for their services. In February 2021, 52 environmental and social organizations (BAN, 2021a) called on the major shipping lines to prove their sustainability commitments by pledging not to transport plastic waste to developing countries. The organizations wrote letters to the nine most prominent global shipping lines: Hapag- Lloyd (Germany), Maersk (Denmark), CMA CGM (France), MSC (Switzerland), Hamburg SUD (Germany), Hyundai Merchant Marine (Korea), Evergreen (Taiwan), COSCO (China), and Orient Shipping (Jordan) (BAN, 2022). They urged them to establish policies to prevent the export of plastic

wastes of all kinds moving from OECD to non-OECD countries or the OECD countries such as Turkey and Mexico.

- Governments and regulatory agencies: These entities oversee the trade of plastic waste and enforce regulations related to waste disposal and recycling. Agencies overseeing plastic waste trade in Indonesia within the Coordinating Ministry of Economy and Industry are the Customs and Excise of the Ministry of Finance (MoF), Ministry of Trade (MoT), Ministry of Industry (MoI), Ministry of Environment and Forestry (MoEF), and to some degree, the Ministry of Foreign Affairs (MoFA). However, although Customs and Excise units are on the front-line, their decision to intercept and confiscate containers will be based on the technical recommendations from the Ministry of Trade and the Ministry of Environment and Forestry.
- Consumers: These individuals purchase products made from recycled plastic, promoting demand for recycled plastics and encouraging recycling efforts.
- Both waste brokers and shipping lines have been implicated in the illegal plastic waste trade. In 2019, for example, Malaysia returned 150 shipping containers of plastic waste to their countries of origin, including the United States, Canada, and the United Kingdom. Authorities found these containers to contain contaminated and nonrecyclable plastic waste, which violated Malaysia's import regulations (Chen et al., 2021).

New Global Rules

As of January 1, 2021, the new plastic waste entries clarify the scope of control under the Basel Convention for other types of plastic waste and mixtures and the specific conditions under which plastic waste is subject to the Prior Informed Consent (PIC) procedure.

As explained on the Basel Convention guidance document, all plastic waste and mixtures of plastic wastes, except waste covered by entry B3011, will be subject to the PIC procedure (Secretariat, 2021). The categories include:

- Plastic waste classified as hazardous waste: new entry A3210 reads, "Plastic waste, including mixtures of such waste, containing or contaminated with Annex I constituents, to the extent that it exhibits an Annex III characteristic (note the related entries Y48 in Annex II and on list B B3011)." Examples of hazardous constituents that may be found in plastic waste due to their use as additives in various applications are lead compounds (used as heat or light stabilizers) and organohalogen compounds (e.g., halogenated organic compounds used as flame retardants).
- Plastic waste requiring special consideration: new entry Y48 covers plastic waste, including mixtures of such wastes, except for those falling under entries A3210 or B3011.

As specified in entry B3011, the following plastic waste will not be subject to the PIC procedure, provided it is destined for recycling in an environmentally sound manner and almost free from contamination and other types of waste:

- Plastic waste almost exclusively consists of one non-halogenated polymer. Such polymers include commonly used ones like polyethylene (PE), polypropylene (PP), and polyethylene terephthalate (PET).
- Plastic waste almost exclusively consists of one cured resin or condensation product. Such resins include urea-formaldehyde resins and epoxy resins.
- Plastic waste almost exclusively consists of one of the following fluorinated polymers:
 - Perfluoroethylene/propylene (FEP)
 - Perfluoroalkoxy alkanes:
 - Tetrafluoroethylene/perfluoroalkyl vinyl ether (PFA)
 - Tetrafluoroethylene/perfluoro methyl vinyl ether (MFA)
 - Polyvinyl fluoride (PVF)
 - Polyvinylidene fluoride (PVDF)

As of 2022, as a Party to Basel Convention, the Indonesian government has not specifically issued new regulations to adopt the Basel Amendment on plastic waste and no PIC list has been communicated to importers.

Indonesia's Responses to Waste Trade Dynamic

Waste Definition, Ports of Entry, and Registered Exporters

Importation of waste is prohibited in Indonesia, as stipulated in the Indonesian Waste Management Law No. 18/2008. Violation of such an Act is equivalent to committing a criminal act. The context for the Article within the Act is subject to the term “trash” instead of “waste.” Further, waste importation is regulated under the jurisdiction of the Ministry of Trade, considering there are recyclable materials that are beneficial as raw materials in manufacturing processes. Certain commodities such as types of metal, rubber, plastic, and paper are included in the Ministry of Trade Regulation that has been developed to regulate the importation of nonhazardous waste. In the last 4 years, there have been several changes to the regulation that oversees nonhazardous waste imports.

The most recent policy regulating plastic waste importation, including paper waste, is the Minister of Trade Regulation No. 20/2021 jo. 25/2022 (MoT Reg. 20/2021 jo. 25/2022) on Import Control and Policy, which replaces the MoT Reg. No. 84/2019 concerning “The Importation of Non-Hazardous Waste as Industry Secondary Raw Materials.” MoT Reg. No. 84/2019 has redefined nonhazardous

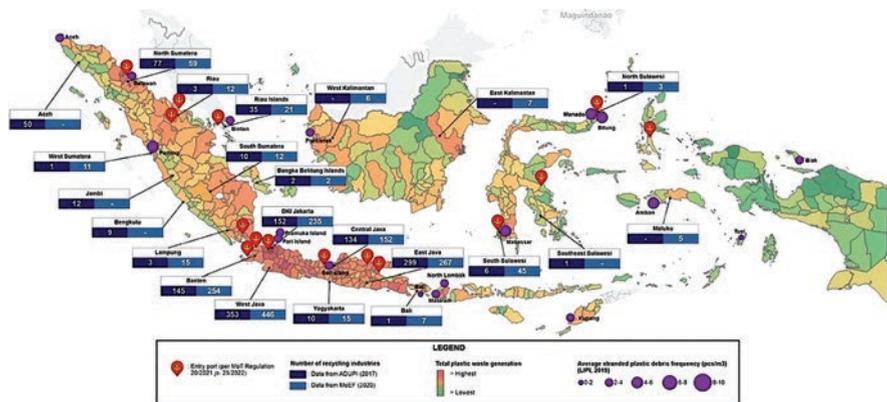


Fig. 1 Locations of plastic industry and recycling industries in Indonesia. (Source: Association of Plastic Recycler Industry/ADUPI, 2021)

waste for importation, as distinct from garbage that has no economic value, or “trash,” as stipulated in the Waste Management Act, including:

- The waste should not be sourced from landfills (clean and not mixed with soil or dirt).
- The waste should not be sourced from household waste.
- The waste should not be contaminated with hazardous materials or waste.
- The waste should be homogenic.

The policy also short-listed the port of entry for these inward shipments, only certain entry portal was available (see Fig. 1):

1. Tanjung Priok Port, DKI Jakarta Province
2. Tanjung Emas Port, Central Java Province
3. Tanjung Perak Port, Eastern Java Province
4. Soekarno Hatta Port, Southeast Sulawesi Province
5. Belawan Port, North Sumatra Province
6. Batu Ampar Port, Riau Islands Province
7. Teluk Lamong Port, Eastern Java Province
8. Merak Port, Banten Province
9. Weda Port, North Maluku Province (addition from MoT Reg. 92/2019)
10. Cigading Port, Banten Province (addition from MoT Reg. 92/2019)
11. Bahodopi Port, Central Sulawesi Province (addition from MoT Reg. 92/2019)
12. Bitung Port, North Sulawesi Province (addition from MoT Reg. 92/2019)
13. Pekanbaru Port, Riau Province (addition from MoT Reg. 83/2020)
14. Sekupang Port, Riau Islands Province (addition from MoT Reg. 20/2021)
15. Panjang Port, Lampung Province (addition from MoT Reg. 25/2022)

The first amendment of MoT Reg. 84/2019 issued in MoT Reg. 92/2019 further detailed the means of shipment. It prohibits transfer shipments in other ports not

indicated in the shipment documents unless the shipment is kept sealed and intact. It also added the requirement to include the exporters' company profiles and track records validated by relevant authorities. They must obtain registration certificates at the Indonesian Embassies or Consulates in the exporting countries (T. KBRI, 2021; W. KBRI, 2021).

Up to August 2021, the Ministry of Foreign Affairs has issued 355 Certificates of Registered Exporters (*Bukti Eksportir Terdaftar/BET*) in 28 countries. Forty-one Indonesian Embassies and Consulates issued these exporters' registration certificates. Most registered exporters are in the United States (62 exporters), Australia (38 exporters), Japan (53 exporters), the United Kingdom (24 exporters), and Singapore (48 exporters) (see Table 1) (Kemenlu, 2021).

While the second and third amendment in MoT Reg. 58/2020 and MoT Reg. 83/2020 is mainly amendments to administrative and permit details, the rest of the amendment is to merge the nonhazardous waste import regulation list with all the other regulated commodities into one regulation paper, with the additional ports of entry.

Waste Contaminants and National Recycling Capacity

Several relevant authorities, namely, the MoT, MoEF, MoI, and the National Police, issued a joint decree in May 2020 to set a 2% maximum contamination for imported plastic and paper scraps. These allowable contaminants include the taping to tie the bales, the bale separator within the container shipments, the pallet or the base beneath the shipment bales, and the wrapping. These contaminants, however, should

Table 1 Number of registered exporters (August 2021)

Country	# of registered exporters	Country	# of registered exporters
United States	62	Norway	3
Japan	53	Belgium	3
Singapore	48	France	3
Australia	38	Portugal	3
United Kingdom	24	Greece	3
South Korea	18	Poland	2
Netherland	17	Bahrain	2
New Zealand	15	Philippines	1
Italy	10	Denmark	1
Canada	9	Papua New Guinea	1
Malaysia	9	Austria	1
Germany	9	Vietnam	1
Spain	7	Brunei Darussalam	1
Brazil	6	Jordan	1
Chile	4	--	--

Source: Kemenlu, Min. of Foreign Affairs (2021)

not be mixed or contain hazardous materials and waste (e.g., medical waste, electronic waste, and radioactive materials), containers of hazardous materials and waste, drugs packaging, liquid leakage other than water, household waste (e.g., apparel waste, diapers, sanitary pad, food waste, toys, etc.), nonrecyclable single-use plastic, wood scraps, and dirt. These contaminants are the importer's responsibility to treat and manage or cooperate with other industries to treat, as it is also included in the checklist before MoEF issue recommendation for import permit application (Nexus3, 2021). As part of the checklist for importers, the MoEF includes a point in the integrity pact to be signed by the importer, a statement "7. The quantity of the non-hazardous waste that will be imported is no more than 50% of the production's capacity." However, this integrity pack statement is no longer available online. The form has been replaced with a new form (see Fig. 2) that looks likely edited from the recommendation lists for importers of hazardous wastes (Limbah Bahan Berbahaya Beracun or LB3) (KLHK, 2020).

The joint regulation also mandated the government to develop a baseline study to establish a roadmap for nonhazardous waste management for industrial purposes (Sugasri et al., 2021). Further, the roadmap would set out incremental restrictions and import quotas depending on the availability of materials for plastic and paper recycling over time. This applies to the Basel Convention update since specific requirements from countries are allowed under the amendment.

During incoming shipment processes, customs authorities would receive import notification and the necessary documents, including the import approval and surveyor report. In addition, the Indonesia National Single Window (INSW) – a synchronizing platform for permitting, customs clearance, and release – and the customs risk management system alert mandatory and random inspection for incoming shipments (Cukai, 2020).

Indonesia has yet to determine its national recycling capacity to handle plastic waste, even domestically. The Ministry of Environment and Forestry Regulation No. 97/2017 already planned and stipulated a national program-based strategy. However, they have yet to include performance-based indicators. For instance, the plan to enact incentives or disincentives in 11 cities/regencies to go beyond compliance in recycling has no percentage or volume targets. This creates big unknowns for recyclers to scout or collect recyclable waste.

The national annual plastic production is 6.8 million tons, but the recycling industry is only equipped to accommodate two million tons of recycling capacity. The Centre of Green Industry (*Pusat Industri Hijau*), under the MoI, emphasized that the lack of capability in waste sorting, collection, and transportation was the main reason the Indonesian industry still needs to import plastic waste from abroad (Sanderson, 2021) (see also Fig. 3). The national recycling capacity and the plan to incrementally reduce import quotas will be addressed in the *Roadmap of Non-Hazardous Waste Management as Secondary Raw Material for Industries*.

LETTER HEAD OF IMPORTER (COMPANY)

INTEGRITY PACK

Recommendation request for Importation of Non-Hazardous Waste from (company name) on (address).

I, (name of executive director), as the executive director, declared that:

1. I shall be in the act of full transparency, honesty, objective, and accountable in the process of creating this recommendation for non-hazardous waste import;
2. I shall request the recommendation as accordingly to procedures and statutory provisions that currently are taking into force;
3. I shall carry out all provisions and obligations in accordance with decisions stipulated in the recommendations and/or statutory provisions;
4. I shall prevent the occurrence of environmental pollution and use environmentally friendly technology;
5. The non-hazardous waste that are requested to be imported are not within the prohibited list;
6. The non-hazardous waste that will be imported suffices the necessary demand and is technologically available;
7. The quantity of the non-hazardous waste that will be imported are no more than 50% of the production capacity;
8. I shall conduct production that prioritizes domestically sourced secondary raw materials;
9. I shall ensure the non-hazardous waste that will be imported are converted to downstream products;
10. If I violate my previous statement points, I am willing to accept sanctions according to the statutory provision.

(place of agreement), (date of agreement)
Signatory,

(sign + stamp)

(name of signatory)

Fig. 2 Template of agreement letter from the MoEF for Indonesia importers. (Source: Kementerian Lingkungan Hidup dan Kehutanan, 2020)

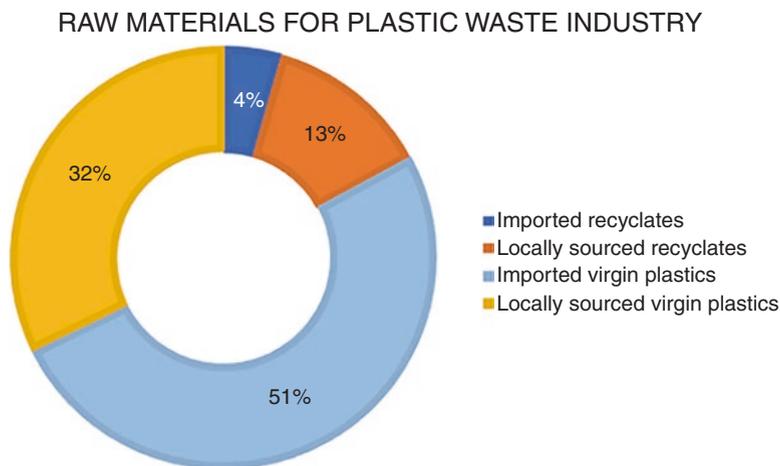


Fig. 3 Raw materials for plastic industry in Indonesia. (Source: Ministry of Industry)

Plastics and Paper Wastes Imported by Indonesia

Plastic Waste Imports

After 2018, the inflow of plastic waste trade to Indonesia increased from the United States, Australia, the United Kingdom, and Spain. Meanwhile, Malaysia imported significant shipments of plastic waste from the United States, the United Kingdom, and Spain (The International Criminal Police Organization, 2020). At the peak of Indonesia's import of plastic waste in 2018, imports of plastic waste to Indonesia rose from different regions of the world, either from North America (fourfold), Europe (eightfold), as well as Australia and Oceania (34%).

The plastic waste trade volume decreased overall after the restriction and reviewed regulations in Indonesia in 2019. Shipments from Australia and Oceania dropped by almost half to 43,000 tons, and from North America by 30% to 37,000 tons, dominated by the Marshall Islands and the United States, respectively. However, shipments from Western European countries rose to 107,000 tons, making the region the most significant source of plastic waste imported by Indonesia until today. The latest data from 2020 showed that shipments from West Europe accounted for 57% of total imported plastic waste to Indonesia (see Fig. 4). Despite the fluctuation in the total trade value, which is also dependent on the shipment quantity, the average tonnage price for imports and export shows an increasing trend (see Fig. 5).

Indonesia's import partner of plastic waste was dominated by trade partners from North America, mainly from the United States, until 2016. In the same year, emerging shipments came from the Marshall Islands with no export reports from their end (Ismawati & Septiono, 2019). The following year, imports from the United States sharply decreased by 70%, reaching 11,000 tons. At the same time, Indonesia reported shipments from the Marshall Islands tripled to 68,000 tons, making

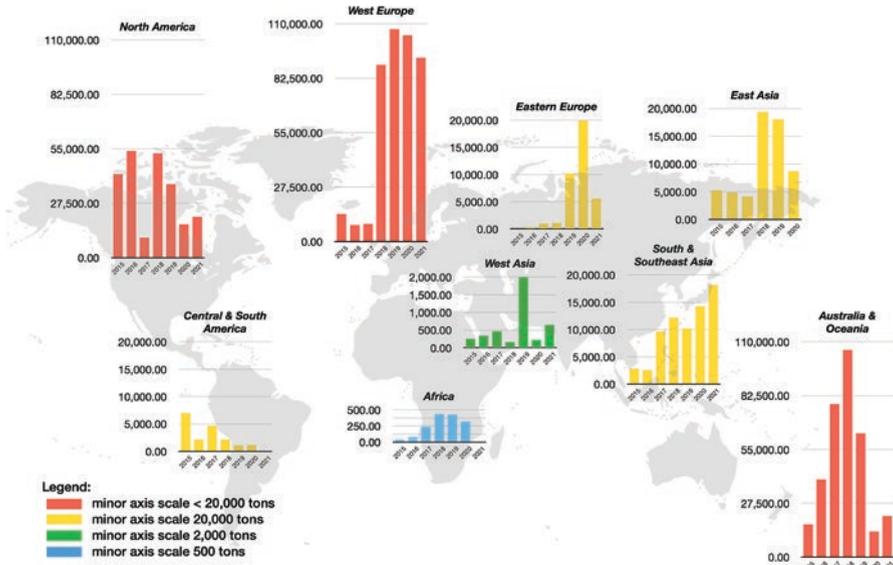


Fig. 4 Indonesia's import of plastic waste (HS Code 3915) by region (in tons). (Source: Indonesia Bureau of Statistics)

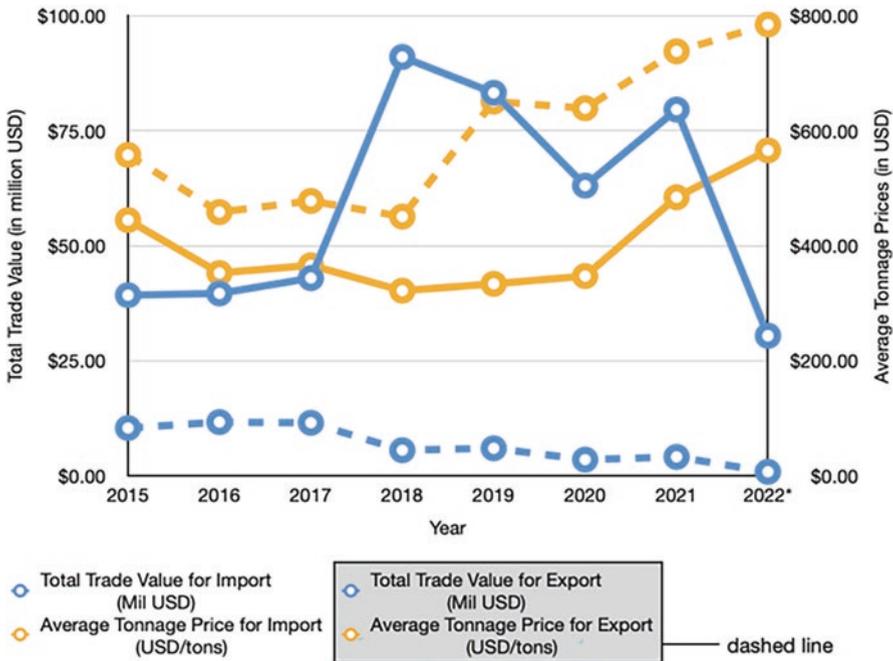


Fig. 5 Fluctuations in annual average tonnage import and export price of plastic scraps (HS3915). (Source: Indonesia Bureau of Statistics *Data in 2022 is only available for January–March)

shipments from the Marshall Islands the most significant volume of imports in 2017 (Septiono & Ismawati, 2022).

The reviewed nonhazardous waste import regulation resulted in the short-listed port of entry through which plastic and paper waste shipments were allowed to enter Indonesia. However, there was a minor shipment to Sekupang Port and several airports, which was not included in the MoT 92/2019 list, probably due to the reviewed date in October 2019.

In 2019 and 2020, the port of entry shifted from predominantly Tanjung Priok in Jakarta Province (Ismawati & Septiono, 2019) to Batu Ampar Port in Batam City, Riau Islands Province (52% and 75% in 2019 and 2020, respectively). Tanjung Priok Port is still the second-highest entry port for plastic waste (42% and 12% in 2019 and 2020, respectively), followed by Belawan Port. A small quantity of paper waste imports is still observed in four airports of Semarang, Tangerang, Pontianak, and Surabaya cities.

Paper Waste Imports

The investigations of paper waste imports in the plastic waste trade arose due to multiple news coverage of plastic waste contamination in paper waste shipments (The International Criminal Police Organization, 2020). Indonesia's paper mills and paper recycling companies demanded 320,000 tons for their processes (Kurniawan, 2019). The import of paper waste peaked in 2019, reaching more than 3,180,000 tons, tenfold higher than the demand from paper recycling companies. In 2020, the import volumes slightly decreased to 3 million tons.

Plastic wastes often become paper scrap contaminants. In addition, Indonesian paper mills are not equipped with treatment capacity for certain types of plastics that are hard to recycle. This unwanted plastic was thrown out or "donated" by the importing paper companies to local communities to further "illegally" sort and sent to middlemen for recycling or downcycling (Ismawati & Septiono, 2019; Septiono & Ismawati, 2022).

Paper scrap imports predominantly consisted of paper waste under HS code 4707.10, non-bleached corrugated paper, or cardboard. The import shipment proportion of mixed paper (HS code 4707.90) was higher before significantly decreasing to 0.53% of the total paper waste shipments in 2020.

Indonesia receives paper waste shipments dominantly from Western European countries (see Fig. 6). Shipments from West Europe almost doubled in 2018 from the previous year to 1,158,307 tons. In 2018 and 2019, there was also a temporary increase in paper waste imports from North American Region, with a little more than 2 million tons in total for both years, before dropping back to 403,000 tons in 2020.

Shipments from the North Americas are mainly sourced from the United States, while Western European countries varied, including from the United Kingdom,

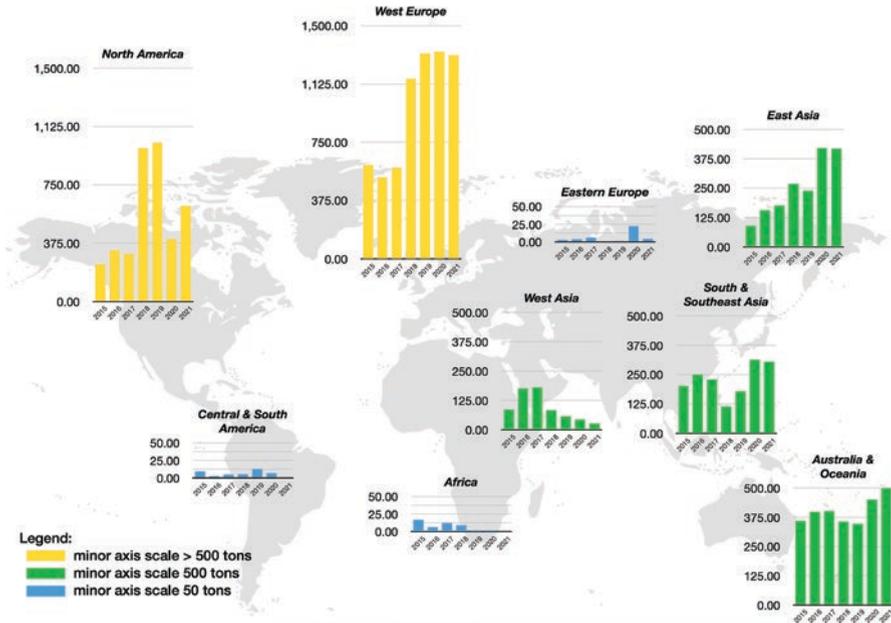


Fig. 6 Indonesia’s import of paper waste (HS Code 4707), by region, in thousand tons. (Source: Indonesia Bureau of Statistics)

Netherlands, Italy, France, Greece, and others. Paper waste imported from Asia predominantly originated from Japan and Singapore. In 2020, the three highest import volumes came from Italy, the United States, and Australia (Septiono & Ismawati, 2022).

About 67% of the paper scrap shipment’s port of entry was Tanjung Priok in 2019 and 2020. Figs. 7 and 8 show plastic contaminant landfill and piles belong to paper industries near Jakarta. The second highest port of entry receiving paper waste was Tanjung Perak in East Java, followed by Tanjung Emas in Central Java. The entry port for paper waste is dominated across Java Island and Riau Islands Province, where most paper industries are located (APKI, 2022; Asosiasi Industri Pulp and Kertas Indonesia, 2021; Septiono & Ismawati, 2022). The import entry points of Batu Ampar, Tanjung Priok, Tanjung Perak, and Tanjung Emas ports were according to the revised MoT Reg No. 84/2019. A small quantity of paper waste imports is still observed in three airports in Bali, Tangerang, and Surabaya.

In East Java and West Java, unwanted plastic waste dumped by paper mills that imported paper scraps as their production materials were delivered by factory drivers every day to the nearby villages. Communities took the opportunity to make money from these leftover scraps and sell it for fuel to tofu factories or lime furnace



Fig. 7 A mountain of plastic waste contaminants in a private landfill belongs to one of the largest paper mills in Indonesia, PT Indah Kiat in Serang. (Photo credit: Yuyun Ismawati)



Fig. 8 Plastic waste contaminants from one paper mills in Karawang, Indonesia, to be transferred to lime burning plants near the factory. (Photo credit: Tio Septiono)

owners (Ismawati & Septiono, 2019) (see Figs. 9 and 10). Plastic burning as fuel without proper tools and equipment releases black smoke and toxic emissions to the surroundings. Studies conducted in 2019 (Petrlik et al., 2019) and 2022 (Petrlik et al., 2022) showed high levels of dioxins and toxic chemicals released into the environment, entering the food chains.



Fig. 9 Tropodo village in East Java is a tofu-making village that uses plastic scrap as fuel, purchased from paper factories. (Photo credit: Yuyun Ismawati)



Fig. 10 (Left) Dried shredded plastic waste from paper mill company prepared to be used as fuel in a tofu factory. (Photo credit: Yuyun Ismawati). (Right) Discarded plastic waste from paper companies, sponges, and tires used as fuel to burn lime in Karawang. (Photo credit: Yuyun Ismawati)

Like plastic scraps, the recycled imported nonhazardous paper waste would be distributed to the paper production companies. Paper scraps are needed to produce various paper products, gypsum boards, asbestos boards, and recovered pulps. The distribution of paper production companies in Indonesia mainly concentrated in Java and Sumatera Island. Fifty-two companies have a total production capacity of 12.6 million tons, although they only produced 7.6 million tons of products in 2020 (APKI, 2021). In 2020, total demand for paper scraps was 6.6 million tons with an import volume of 3 million, covering 50% of the total demand. The market for paper scraps is projected to increase to over 8 million tons in 2024 (Asosiasi Industri Pulp and Kertas Indonesia, 2021).

Indonesia's Waste Trade Partner

OECD Countries

Since 2016, global export from OECD countries has declined from a little over 7 million tons that year to almost 3 million tons in 2020, due to China's restriction policy. However, the market for plastic waste exports for OECD countries still exists in some European countries, like Turkey, and Asian countries, including Southeast Asia.

Regarding their trade with Indonesia, OECD countries' export to Indonesia spiked in 2018 when China enacted their waste import inspection program, the Blue Sky Policy, a continuation from the National Sword Policy in 2017. Among the OECD country members, the three largest countries that exported their plastic waste to Indonesia were the Netherlands (58,326.8 tons), Germany (42,421.28 tons), and Japan (26,718.63 tons). OECD countries also received plastic waste scraps from Indonesia, increasing from 2016 (6479.43 tons) to 2020 (23,725.00 tons). In 2020, the three largest countries that imported plastic waste from Indonesia were the United States (13,140.64 tons), Belgium (4713.70 tons), and Ireland (3945.58 tons) (Septiono & Ismawati, 2022). However, after 2021, the EU was the major exporter of plastic waste to Indonesia which mainly came from the Netherlands (see Figs. 11 and 12). Plastic waste imports from OECD countries accounted for 62.17% of Indonesia's total import of plastic waste in 2020 alone, dominated by the Netherlands, Germany, Japan, the United States, and Slovenia.

United States

One of Indonesia's largest import partners of plastic waste is the United States. Being a nonparty to Basel Convention, the dynamics of waste trade between Indonesia and the United States raise concerns about the legality under the Basel Convention (Basel Action Network, 2021a, b). The United States exported over 21,000 tons of plastic waste in 2020, declining 37% from their 2016 export to

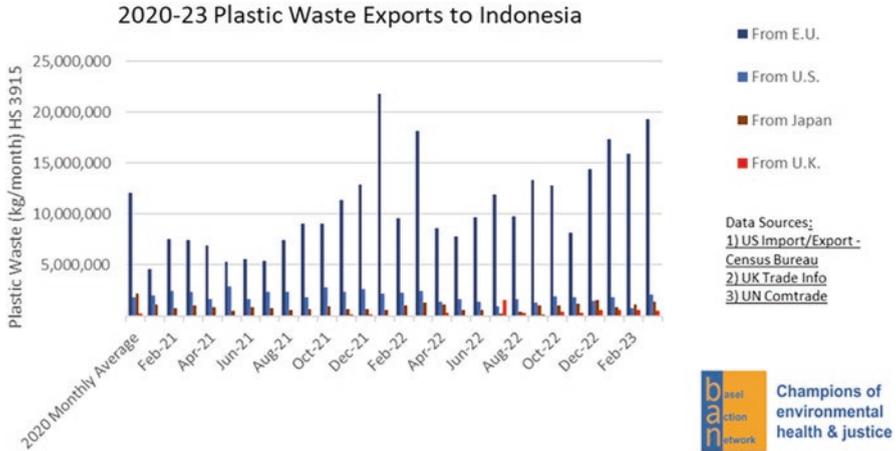


Fig. 11 Plastic waste exports (HS 3915) from the EU, the United States, Japan, and the United Kingdom to Indonesia 2020–2023. (Graph credit: Basel Action Network, 2021a, b)

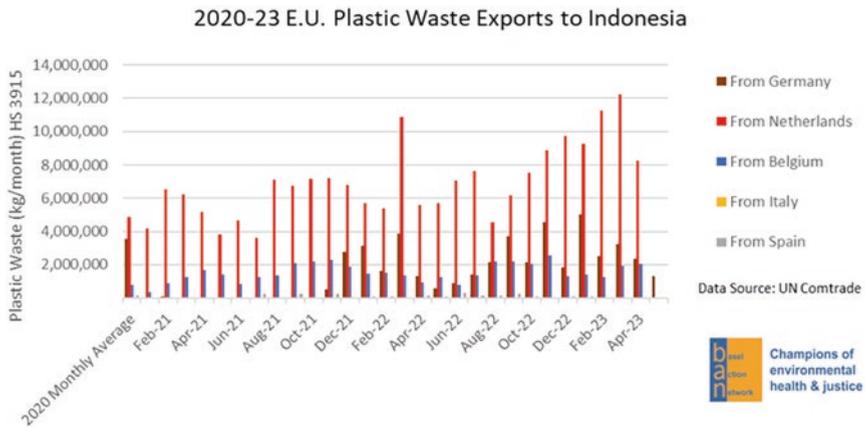


Fig. 12 Plastic waste exports (HS 3915) from the EU to Indonesia 2020–2023. (Graph credit: Basel Action Network, 2021a, b)

Indonesia (34,521 tons). Their import from Indonesia, however, shows an increasing trend from 2016 to 2020. Compared to 2016 imports from Indonesia (1245.19 tons), their import volume rocketed by 955% to 13,140 tons in 2020. Between 2020 and 2023, the major type of plastic waste exported by the United States to Indonesia was HDPE and LDPE (see Fig. 13).

Indonesia is one of the countries of interest of the United States in international waste trade. The US Census Bureau data shows that over 25,900 tons of plastic waste were still exported to Indonesia in 2021. There has been a strong lobby from

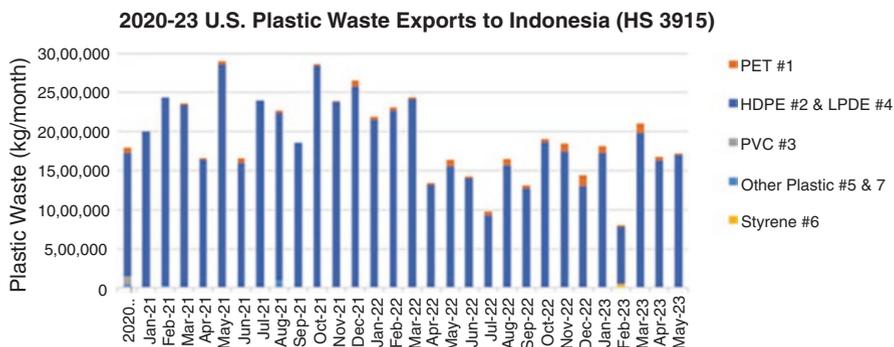


Fig. 13 Plastic waste exports (HS 3915) from the United States to Indonesia 2020–2023. (Graph credit: Basel Action Network, 2021a, b)

American plastic and paper industry associations during the discussion about the contaminant standard process (Ismawati & Septiono, 2019). In addition, the waste trade agreement between Canada and the United States also increases the unknowns about plastic waste that originated between these two countries.

Australia

Indonesia imported 11,464 tons of plastic waste from Australia in 2020, which decreased by approximately 33% from the previous year. The plastic waste imported from Australia fluctuated, with a peak in 2019, reaching 17,277 tons. Between 2020 and 2022, the main plastic waste exported from Australia to Indonesia was ethylene type of plastics (HDPE and LDPE) and other types of plastic, which are potentially contaminants, including PET (see Fig. 14).

Indonesia has re-exported several containers to Australia due to the contamination level that violated the MoT Regulation standards and misdeclarations (Boediwardhana, 2019; Septiari, 2020). One observed impact of these shipment violations on the ground was the infamous use of foreign plastic waste as fuel in tofu-making processes, mainly slipped in together with imported paper waste (Ismawati & Septiono, 2019; Petrlik et al., 2019). Indeed, Australia's most exported waste-derived products to Indonesia is paper waste. In March 2020, the Council of the Australian Government responded to the complaints and protests from CSOs, and public pressure, by prohibiting the export of waste commodities within a certain date (Pickin & Donovan, 2020).

With the prohibition of waste products, Australia was to only export properly processed waste to prevent potential dumping or contamination of such shipments outside of the Australian border (Australian Department of Agriculture, 2021).

At least two significant known material recovery and recycling companies in Australia, RecycleCo Group and Cleanaway, have been shifting to produce process-engineered fuel (PEF) products, and some also aim to export them to Southeast

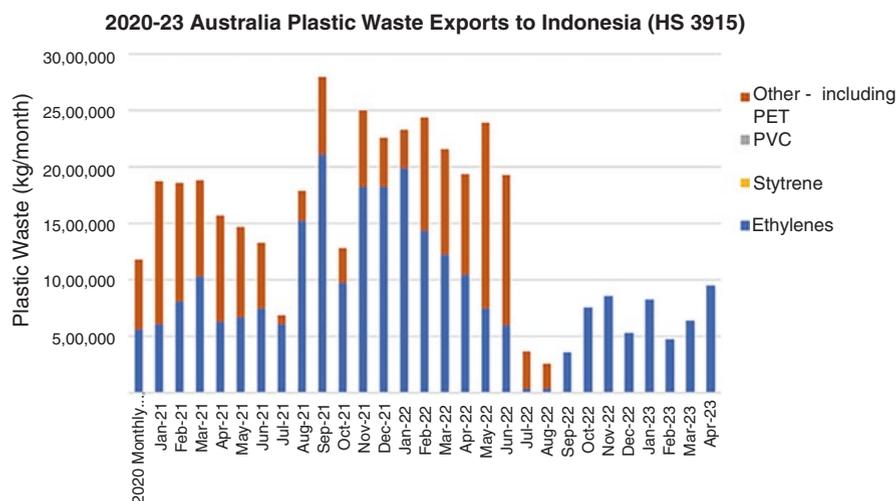


Fig. 14 Plastic waste exports (HS 3915) from Australia to Indonesia 2020–2023. (Graph credit: Basel Action Network, 2021a, b)

Asian region (Australian Clean Energy Finance Corporation, 2020; Metso, 2019; Resource Recycling, 2020; ResourceCo, 2019). This development raises concerns about potential loopholes in the MoT Regulation.

Considering PEFs are yet to be defined explicitly in the HS Code, these waste-derived products needed to be added to the Indonesian government's watchlist. In addition, a report from a company in the Philippines has identified commodity code ATHN's 38,251,000 (Holcim Philippines, 2019), which could also apply in Indonesia. If such commodities are being pushed and imported, the trade of PEFs or refused-derived fuels (RDFs) will undermine the Indonesian government's current measures to increase solid waste treatment capacity and domestic recycling rate. However, since the Basel Convention amendments have not provided clear guidance about the identified HS codes for PEF, RDF, or solid-recovered fuel (SRF), the mislabeling of plastic fuels as mixed waste meant for recycling could lead to new problems in the importing countries.

ASEAN Member Countries

Among country members of the Association of Southeast Asian Nations (ASEAN), only Indonesia, Singapore, and Malaysia have ratified the Basel Convention, which at least provides added environmental protection within the global environmental law framework. Indonesia has trade relations with ASEAN country members. As an exporter of plastic scraps, Indonesia's export spiked in 2018 (13,153.10 tons) to Malaysia (40.53%), Vietnam (28.3%), and Thailand (17.11%) (see Fig. 15). Among

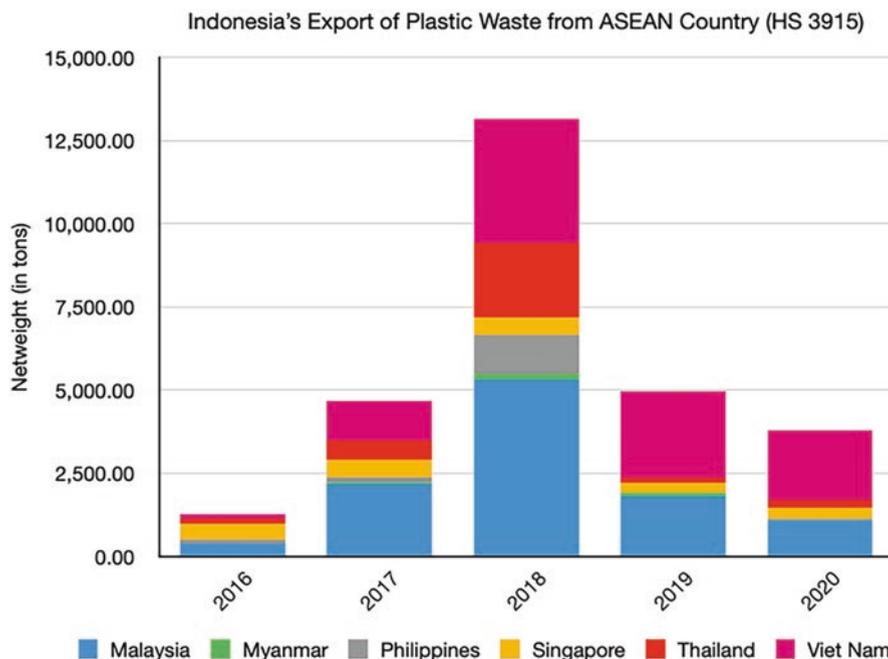


Fig. 15 Indonesia plastic waste exports (HS 3915) to ASEAN countries 2016–2020. (Source: Indonesia Bureau of Statistics)

the ASEAN countries, Indonesia exported to Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

Aside from export, Indonesia imported plastic waste from Malaysia, the Philippines, Singapore, Thailand, and Vietnam. Further, the import volumes from ASEAN countries show an increasing trend until 2020 (14,272.64 tons), mainly from Singapore and Malaysia (see Fig. 16). The high import volume from Singapore may also occur because Singapore is a trade hub of Southeast Asian countries (Capri, 2021; Singapore Economic Development Board, 2021).

Data Discrepancies

We found discrepancies in plastic waste trade data in both export and import. We compared databases from Indonesia Statistics and UN Comtrade for plastic waste import and export. Tables 2 and 3 show three data types: Indonesia Statistics, Indonesia reports in the UN Comtrade, and country partner reports in the UN Comtrade.

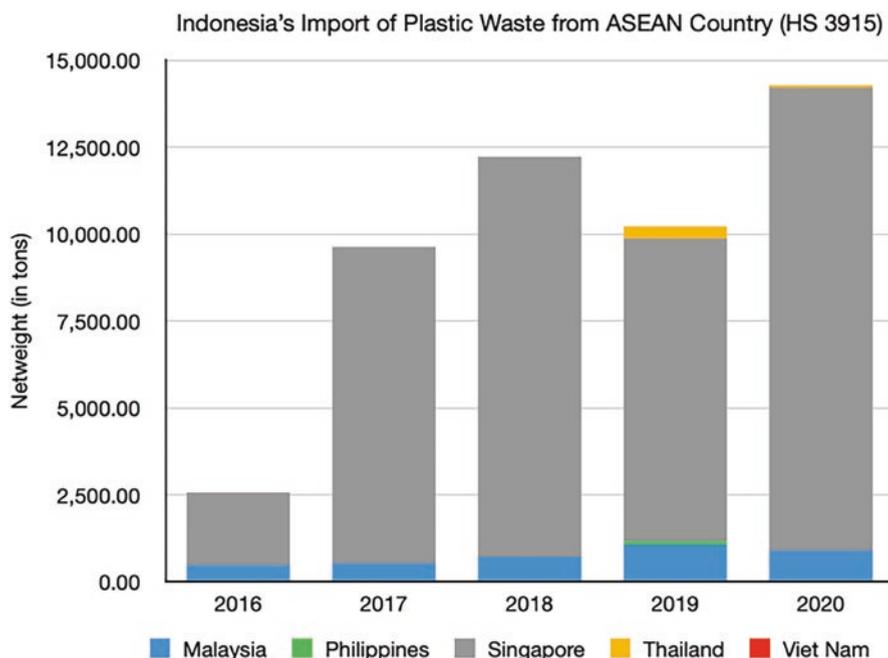


Fig. 16 Indonesia plastic waste imports (HS 3915) from ASEAN countries 2016–2020. (Source: Indonesia Bureau of Statistics, 2021)

In this mirroring data analysis of import data, positive discrepancy values indicate that the country reported more quantity than Indonesia received. For import, the highest discrepancy was found in the import data from the Marshall Islands in 2016, 2017, and 2018. However, no report of plastic waste export from the Marshall Islands was recorded (Ismawati & Septiono, 2019). The latest data in 2020 showed a difference of more than 32,000 tons, meaning the country partner recorded higher volumes of exported plastic waste than Indonesia's import record.

For export, negative values in the discrepancies show that the country partners recorded more plastic waste imported compared to what Indonesia exported. In 2020, for instance, there was a negative 11,000 ton discrepancy between the data from Indonesia Statistics and country partner reports in the UN Comtrade data.

Discrepancies between import and export data from both countries may occur due to the differences in recording and documentation systems in each country. For instance, Indonesia keeps import records by country of origin and does not document transit consignment of goods in third countries before they arrive at the destinations (see Table 4) (Septiono & Ismawati, 2022).

Table 2 Indonesia's import of plastic waste report (HS Code 3915) period of 2015–2020

Year	UN Comtrade											
	Indonesia report						Country partner report					
	Indonesia statistics			Indonesia report data			Data discrepancy		Country partner report data		Data discrepancy	
	Netweight (Ton) (2)	Trade value (Mil USD) (3)		Netweight (Ton) (4)	Trade value (Mil USD) (5)		Netweight (Ton) (4)–(2) (6)	Trade value (Mil USD) (5)–(3) (7)	Netweight (Ton) (8)	Trade value (Mil USD) (9)	Netweight (Ton) (8)–(2) (10)	Trade value (Mil USD) (9)–(3) (11)
2015	88,240.19	\$39.20		97,146.23	\$42.74		8906.04	\$3.54	115,095.70	\$47.87	26,855.51	\$8.66
2016	112,366.42	\$39.58		120,978.86	\$42.48		8612.44	\$2.90	104,055.12	\$31.20	-8311.31	-\$8.39
2017	117,383.43	\$42.91		128,951.34	\$45.87		11,567.91	\$2.95	121,567.81	\$33.54	4184.37	-\$9.38
2018	283,152.25	\$91.02		320,451.81	\$102.37		37,299.56	\$11.35	320,259.04	\$79.43	37,106.79	-\$11.59
2019	249,618.37	\$83.22		249,618.39	\$83.22		0.02	\$0.00	231,639.45	\$66.75	-17,978.92	-\$16.47
2020	181,718.75	\$63.04							213,923.61	\$67.12	32,204.86	\$4.09

Source: Indonesia Bureau of Statistics and UN Comtrade (2021)

Table 3 Indonesia's export of plastic waste (HS Code 3915) 2015–2020

Year	UN Comtrade										
	Indonesia report						Country partner report				
	Indonesia statistics			Indonesia report data			Data discrepancy		Country partner report data		Data discrepancy
	Netweight (Ton)	Trade value (Mil USD)	Netweight (Ton)	Trade value (Mil USD)	Netweight (Ton) (4)–(2)	Trade value (Mil USD) (5)–(3)	Netweight (Ton) (8)	Trade value (Mil USD) (9)	Netweight (Ton) (8)–(2)	Trade value (Mil USD) (9)–(3)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
2015	148,734.61	\$82.95	148,734.61	\$82.95	-0.00	\$0.00	142,102.99	\$88.35	-6631.61	\$5.40	
2016	203,586.22	\$93.28	203,586.22	\$93.28	-0.00	\$0.00	213,009.76	\$113.97	9423.54	\$20.68	
2017	192,891.17	\$92.13	193,544.82	\$92.28	653.65	\$0.15	229,312.25	\$141.24	36,421.08	\$49.11	
2018	98,450.21	\$44.34	98,516.36	\$44.34	66.15	-\$0.00	36,031.87	\$24.40	-62,418.34	-\$19.94	
2019	73,275.20	\$47.67	73,277.24	\$47.67	2.04	\$0.00	33,509.40	\$25.75	-39,765.80	-\$21.92	
2020	43,724.72	\$27.94					32,349.88	\$23.61	-11,374.84	-\$4.32	

Source: Indonesia Bureau of Statistics and UN Comtrade (2021)

Table 4 Trading partners acknowledgement in Indonesia

Trade	Partner countries	Indonesia
Import	Country of origin + country of consignment	Country of origin
Export	Country of last-known destination + country of consignment	Country of last-known destination

Source: *Direktorat Jendral Bea dan Cukai, Kementerian Keuangan* (Cukai, 2015)

Illicit Waste Trade Cases

Between 2019 and 2022, several cases of illicit waste trade attracted significant attention from officials and the public. Some of these cases were triggered by civil society reports or community complaints.

The investigations in 2019 were prompted by several reports from Ecological Observation and Wetlands Conservation (Ecoton) and Nexus for Health, Environment, and Development Foundation (Nexus3 Foundation) about illegal dumping and burning of plastic waste properly in West Java, Banten, and East Java Provinces, which were then covered by several national and international media. The importing company rejected several plastic types from the declared plastic (HS 3915) and paper waste (HS 4707) due to the lack of technical and economic feasibility of recycling. These unwanted materials were then “donated,” sold, or dumped on the communities around the factories, violating MoT Reg. No. 31/2016 (Ismawati et al., 2019, 2022; Petrlik et al., 2019, 2022; Septiono et al., 2021).

In June 2019, 65 container shipments inspected by Customs in Batu Ampar Port, Batam, from four different importing companies: PT. Royal Citra Bersama, PT. Arya Wiraraja Plastikindo, PT. Tanindo Sukses, and PT. Hongtay. The imported plastic scraps were suspected to be contaminated with hazardous waste, violating the MOT Decree 31/2016 at the time (Helmi, 2019).

Despite the government claiming to repatriate the violated shipments, some of the re-exported waste did not end up back in the country of origin. In June 2019, 58 containers were meant to be returned to the United States. However, only 12 containers docked in the United States. The remaining were re-routed to India, Thailand, Vietnam, South Korea, Mexico, Netherlands, and Canada (BAN & Foundation, 2019). In response to the report that the shipments had ended up in India, Indonesian MoEF and Customs representatives refused to acknowledge that the containers were re-exported to other countries instead of the country of origin. They stated that the shipments were still on the way to their destinations. The Indonesian officials also indicated that re-exportation is a law mandate and “if importers do not re-export properly, they would be subject to administrative sanctions by revocation of import permits, and companies could also be subject to criminal sanctions to provide a deterrent effect” (Arumningtyas & Maulidin, 2019).

Article 39 of Law No. 18/2008 states that “anyone who unlawfully imports and/or imports household waste and/or household waste-like waste into the territory of the Unitary State of the Republic of Indonesia is punishable by imprisonment for a minimum of 3 (three) years and a maximum of 9 (nine) years and a fine of at least

Rp 100,000,000.00 (one hundred million rupiah) and a maximum of Rp 3,000,000,000.00 (three billion rupiah)” (Wahyudi et al., 2020). Synergy between Customs, the Ministry of Environment and Forestry, and other state agencies is needed to enforce the law. However, although PT MSE and PT SM found violating the law, they have never been sanctioned and are still running their operations until now. A trusted source stated that the two companies were “sacrificed” because they are not members of the pulp and paper industry association.

Indonesian Customs and the MoEF seized another 102 incoming plastic waste shipments in September 2019, imported by PT. New Harvestindo International (PT NHI). The 23 containers were contaminated with hazardous waste, while 79 passed the clearance and continued to be released. Further, the contaminated waste containers were re-exported to Australia (13 containers), the United States (7 containers), New Zealand (2 containers), and the United Kingdom (one container). In addition, the Tangerang Region Customs also seized 138 container shipments of mixed plastic waste imported by PT. New Harvestindo International. The shipments were partially cleared (29 containers), while the remaining 109 containers were reexported back to Australia (80 containers), the United States (4 containers), New Zealand (3 containers), and the United Kingdom (22 containers) (Astuti, 2019; Direktorat Jenderal Bea dan Cukai, 2021).

In addition to PT NHI case, another 24 containers found lacked of proper permitting documents among import shipments by PT. Advanced Recycle Technology (PT ART). Ten containers were contaminated and were traced back and re-exported to Hong Kong (three containers) and Australia (seven containers) (Astuti, 2019). Customs cleared the remaining 14 containers after inspections.

Due to the high influx of imported nonhazardous waste and the risk to human health and the environment, the Secretary of Cabinet arranged a meeting in August 2019 to discuss the matter. The meeting established general decisions to maximize domestic sources of waste, improve waste management, and implement stricter enforcement (Sekretariat Kabinet Republik Indonesia, 2019; Watubun, 2019).

In October 2019, the Indonesian authorities identified two Singaporeans, with an alias LSW and KWL, involved in smuggling the imported contaminated plastic scrap. The imported shipments were contaminated by used remote controls, batteries, printed circuit boards, and wires, despite the lack of necessary import documents (Septiari, 2021). LSW was subjected to Articles 105 and 106 of the Environmental Management and Protection Act (Law No. 32/2009), with a potential maximum sentence of 15 years and a fine of Rp 15 billion (USD 1 million) (Syahni, 2019). However, their court paperwork was never followed up.

Until early 2020, more than 1000 containers had already been seized for inspection at Tanjung Priok Port (Jakarta). Such a condition prompted the MoEF, Commission IV of the House of Representatives, Ministry of Maritime and Investments, Ministry of Trade, and Customs and Excise to conduct the unexpected inspection, specifically to check the KSO SCISI (KSO SCISI is a collaboration between two Indonesian state-owned enterprises in the field of testing, inspections, and certifications) office in Tanjung Priok port.

The team sampled several containers and observed multiple MoT Regulation No. 84/2019 violations. The visit (Kementerian Lingkungan Hidup dan Kehutanan, 2020) concluded that:

- Customs and Excise would organize for re-exportation, with the Basel Convention focal point when found relevant.
- The House of Representatives agreed that contaminated imported waste was not eligible for plastic processing and recycling raw materials.
- Sanction for KSO-CSISI, the surveyor company, and possible replacement of surveyor companies that violated the rules supported by evidence.
- Review of KSO-SCISI's performance in validating nonhazardous waste import shipments is needed.

A series of meetings, with multiple ministries and parliament committee members involved, was held over the matter (Risalah Rapat Dengar Pendapat Komisi IV DPR RI dengan Kementerian Luar Negeri, Kementerian Lingkungan Hidup dan Kehutanan RI, Kementerian Perdagangan RI, Kementerian Perindustrian RI, dan Kementerian Keuangan RI (Bidang Pertanian, Lingkungan Hidup dan Kehutanan, dan Kelautan, 2020). In May 2020, a limited ministry coordination meeting established decisions to re-export the confiscated containers. Based on Cabinet Secretariat Letter No. B.164/Seskab/Ekon/05/2020, they decided to develop a scheme for exterminating the unclaimed containers which were unable to be re-exported. The letter informed of several decisions to (Direktorat Jenderal Bea dan Cukai, 2021):

- Start the re-exportation process for the total 63 containers of PT. ART by that time, which did not have a proper surveyor report and import permit document, with the lead from the MoEF.
- Continue the re-exportation process for 107 containers of PT. NHI, which once requested to be exterminated because the Indonesian government had already sent the notification to do so to the country of origin.
- Reinspect 20 containers of PT. AWP in Batam Customs.
- Reinspect 114 containers of PT. NHI (which was later confirmed by the MoEF letter No. S.241/PSLB3/VPLB3/PLB.3/06/2020 on June 2020 (mediaindonesia.com, 2020)).
- Exterminate 901 containers belonging to PT. NHI, which had no proper import permit document, with the lead from the MoEF. PT NHI should bear the cost of extermination (which was confirmed by the MoEF letter No. S478/VPLB3/PLB.3/06/2020 on June 2020 (mediaindonesia.com, 2020)).

Further, due to the continuous and large quantity of incoming flagged shipments, several multistakeholder meetings of national agencies' task forces continued for coordination. As of August 2020, the Indonesian Customs and the MoEF inspected 1146 containers declared as nonhazardous waste with the remaining 1078 uninspected at the time, making a total of 2224 containers under their watch. Later, the task force cleared 562 containers and declared another 584 containers contaminated with other types of waste commodities, such as household waste and hazardous waste (Direktorat Jenderal Bea dan Cukai, 2021; Septiono & Ismawati, 2022).



Fig. 17 Seized containers suspected contaminated with hazardous wastes. (Photo credit: Liputan 6. (Nurdin, 2019))

In 2020, in total, 450 containers had been re-exported to the countries of origin. The identifiable “contaminated” containers came from multiple countries, and the highest volumes of shipment came from Australia, followed by Germany, the United States, the Netherlands, and others. Most of these containers were intercepted and inspected by Banten and Batam Customs Offices (Direktorat Jenderal Bea dan Cukai, 2021) (see Fig. 17).

Thereafter, the second amendment of the MoT Regulation No. 84/2019 was enacted, along with the previously established Task Force for the Import of Waste (Huda, 2019), had issued a joint-decree setting the maximum contaminant of 2%, and developed the technical guideline for import verification within the MoFA.

In July 2021, the Indonesian Customs and the MoEF started the extermination process of the unresolved investigation and repatriation containers. The Indonesian Customs finally transferred the authorization of the enforcement process to the Directorate of Hazardous Waste Verification (MoEF) that month, following the extermination plan that had been approved by the Task Force for Non-Hazardous Waste Import (mediaindonesia.com, 2020; Ocean Week, 2021).

However, the serious case of PT NHI has never been processed and followed up in court, nor has the company been ordered to pay penalties for the violations in the past. Although the breach of waste importation laws by PT NHI is considered a criminal act, the only punishment given by the Indonesian government for PT NHI was to cancel their import permit. On the contrary, on 30 July 2021, the UK Court fined a waste management company, Biffa Waste Services Ltd., £1.5 million for exporting mixed household wastes to Indonesia and India. This fine is the highest penalty ever ordered by the court for a waste crime case (UK Environment Agency, 2021).

On the 24th of September 2020, local media, citraindonesia.com, covered the first event of PT NHI exterminating nine plastic waste containers in their



Fig. 18 Old bales of plastics waste at PT NHI's premises confiscated in 2019 covered by wild plants. (Photo credit: Yyunus Ismawati)

mini-incinerator. It took 3 days to burn them all. However, when the Nexus3 team tried to access the news for this study, the original link of this online information was no longer available and could not be displayed. Fortunately, the source is available to obtain using the archive search engine (Darling, 2020). Figure 18 taken in March 2022 shows the old bales of mixed plastic waste in PT NHI's premises already covered by wild plants.

Updates from a trusted source stated that the mini-incinerator was broken several times and can only burn the plastic waste for a couple of hours in a day. Until March 2023, when the Nexus3 team found out that PT NHI was still working to exterminate the remaining confiscated plastic wastes, the team spotted new fresh bales of uniform PET bottles in PT NHI's premises. However, when they try to investigate further, the database of PT NHI could not be found anymore in the company registration system.

Since October 2019, Indonesia Maritime, Transportation and Logistics Watch (IMLOW) expressed their concern for the hazard of the lengthy holding time for these containers, posing risks of self-combustion due its material properties, per Indonesian Shipping Act (Law No. 17/2008). The lengthy process also affected the scarce in container availability for exports on the transfer depo (Asosiasi Pengusaha Tempat Penimbunan Sementara Indonesia, 2020; Azka, 2020). Until June 2021, there were still hundreds on containers held in the Tanjung Priok port waiting for extermination (Yati, 2021). Safety practices should be uphold strictly, considering that these containers were loaded with contaminated waste. Importers and shipping companies complained about the accumulated charges of demurrage costs at the ports and demanded authorities review the regulations faster (Pelindo, 2020; Wahyudi et al., 2020).

In February 2021, Basel Action Network and NGOs in Malaysia, Indonesia, and India flagged shipments from the United States (not a party to the Basel Convention) to those countries (parties to the Basel Convention), from a company Newport CH International. In total, five containers received by their Indonesian counterpart on Belawan Port, North Sumatera. Despite the fact that the company declared the shipment as HS Code 3915.10 (plastic waste, parings, and scrap of polyethylene), the shipment should have been considered illegal due to the provisions of Basel Convention, as the United States is yet to be the party of the international agreement (BAN, 2021b).

Conclusions and Recommendations

The issue of nonhazardous waste has been partially addressed in the revision of The Minister of Trade Regulation, which addressed lessons learned from past violation cases of waste importation in Indonesia, and delivered state's liability to protect human health and the environment (Sonia & Sunyowati, 2020).

The government have established several measures to address waste trade challenges and opportunities, such as by setting a new standard of maximum 2% contaminants in waste import shipments, as well as additional procedures, including mandating exporter registration at the Indonesian Embassy in the country of origin, requesting for a master list of importing companies to the Ministry of Industry, having multiple parameter checklists from the Ministry of Environment and Forestry for importer's recommendation letter, and strengthening inspection procedure of the Customs from the regulator's perspective. However, sanctions and punishment for companies violating the rules should be increased and publicly announced.

More needs to be done to minimize the impacts of waste colonialism on Indonesia. The Government of Indonesia is not on track to establish the roadmap for plastic and paper recycling industries. The roadmap should be designed to incrementally reduce the import of nonhazardous waste by setting import quotas, to allow domestically sourced nonhazardous waste or post-consumers plastics and paper to become a main source of secondary materials for the local recycling industries. The roadmap must be developed by relevant ministries and agencies at the national level in consultations with industries and civil society representatives. In parallel, waste management system and infrastructures in the country need to be improved to increase the rate of recycling and recyclability of post-consumer products to feed the recycling industries.

As a Party to Basel, the Government of Indonesia should strengthen Basel Convention enforcement and compliance, especially the repatriation of contaminated waste shipments or return-to-senders. Indonesian authorities should adopt and revise the existing regulations to accommodate the Basel Convention Plastic Waste Amendments that had entered into force on January 1, 2022.

The Ministry of Trade and the Ministry of Foreign Affairs should notify the Indonesian Embassy and Consulates and other relevant stakeholders in exporting

countries about the decision on maximum contaminants. Information on the maximum contaminant limit should not be considered a barrier-to-trade, because the definition and provisions of import of nonhazardous waste is aiming for the ease of the recycling sector. This rule aligns with the Basel Convention amendments on plastic waste trade, where provisions such as being “almost free from contamination” may be supplemented with a specific national point of reference (Secretariat, 2021).

The Ministry of Environment and Forestry should prohibit the imports of nonrecyclable plastic, hard-to-recycle plastics, and waste-derived products (PEFs or RDFs). Mixed plastic and several types of plastic are technically recyclable, but they have higher costs and the risk of releasing toxic chemicals.

Considering Indonesia does not have a protective regulatory framework from the emission standards for multiple persistent organic pollutants (POPs) and emerging and carcinogenic chemicals – such as methylmercury, PBDEs, PCBs, PFAS, and UV-328, and several others – the precautionary principle should be implemented. Mixed plastic poses health risks due to the chemicals, with contamination through plastic components used in electronic products. Chlorinated-based plastic, such as PVC, also releases dioxins and furans during thermal melting and shaping, potentially harming recycling workers.

In addition, Indonesia has already enacted MoEF Reg. 75/2019, which will prohibit the use of some plastics on products by 2030, such as polystyrene and PVC plastics. The use of such plastic types and their demand in the recycling sector will drop due to the regulating policy for the industry. Such policy implications should be considered while developing the Indonesian *Roadmap of Non-Hazardous Waste as Secondary Raw Materials for Industries*.

The Ministry of Environment and Forestry should increase laboratory capacity to improve the safeguarding of public health and the environment. Indonesia is still unable to analyze several POPs, organic metalloids, and other emerging chemicals. Increasing the capacity of commercial and educational laboratories in Indonesia would also lower the cost of laboratory instrumentation and analysis.

The Ministry of Environment and Forestry and the Ministry of Foreign Affairs should maximize the newly established exporter registry for waste repatriation/return-to-sender. Violation in waste shipment harms domestic recycling industries and the public. Ultimately, trade violations in the past increased the burden of environmental and health costs of the public. The Government of Indonesia should apply the lessons learned from past experiences to develop plans for prevention and curative actions to pursue waste repatriation to the country of origin.

Overall, there is a growing recognition among exporting countries that authorities should address illegal waste exports through regulations and enforcement efforts. However, challenges remain, particularly in developing countries with limited enforcement capacity.

Holding waste brokers and shipping lines accountable for their actions is essential. This can be done by implementing stricter regulations on the export and import of plastic waste, increasing penalties for the violation of these regulations, and enforcing these regulations through monitoring and inspections.

It is important to note that not all actors involved in the plastic waste trade are necessarily engaged in illegal activities. However, waste crime and illegal waste trade remain major concerns in the global waste management sector, and effective regulation and enforcement are vital to promoting responsible and sustainable waste management practices.

Finally, efforts to combat waste colonialism and illegal waste trade involve a combination of government regulation and oversight, improved waste management practices, greater social and environmental awareness, and activism.

Acknowledgments The work covered in this paper was produced with the support of Plastic Solution Funds, International Pollutants Elimination Network, and Basel Action Network.

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