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Problem of Plastic Waste, A Comparison of the Systems in Indonesia and the Netherlands: The Urgency of State Intervention and Legal Instruments

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ABSTRACT

The trading phenomenon of plastic waste from the Global North to the Global South has caused environmental issues due to the production and import of poorly managed plastic waste in the recipient countries. This research aims to compare the existing plastic waste management systems in Indonesia and the Netherlands and to examine state intervention and legal instruments in place. Data is analyzed qualitatively by comparing and discussing the juridical and socio-political aspects descriptively, thus highlighting the complexity of the plastic waste issue and the importance of interventions to renew plastic waste management, taking examples from Global North countries like the Netherlands. The Netherlands implements a circular economy scheme with the concept of extended producer responsibility, banning single-use plastics, mandating labeling on plastic products, promoting waste sorting, and increasing public awareness. Through these steps, Indonesia is expected to improve waste management towards environmental sustainability and gradually reduce plastic waste imports

Keywords: Plastic Waste Trade, Circular Economy, Global South, Global North

PENDAHULUAN

Plastics are highly adaptable materials that can be used to make a variety of items, including flexible and rigid items, adhesives, foams, and fibers (Filho et al., 2019). Given their capacity to be cheaply manufactured into a variety of shapes and features, plastics are widely used throughout the economic cycle. Geyer & Jambeck(2017) found that plastics are most widely used in single-use packaging. In 2015, plastics globally were used for transportation (27 million tons (Mt)), building and construction (65 million), textiles (59 million), consumer and institutional goods (42 million), and electrical equipment (18 million). Yet plastics are not handled in a way that matches their mass production.

Processing plastic waste is very difficult because plastic particles are difficult to decompose, so this can have several consequences for the environment (Oktavilia et al., 2020). Plastic waste should be reprocessed and recycled. However, often, rather than being processed for energy or disposed of in landfills, the plastic is simply dumped into the environment after use. Untreated plastic waste will be difficult to track, so it is lost in rivers and even in the waters between countries (Pacini et al., 2021).

Plastic waste has become a political issue in several countries, especially developed countries that have a large amount of plastic waste. Developed countries prefer to sell their plastic waste to other countries because processing plastic waste themselves is expensive and time-consuming. On the other hand, some developing countries need a lot of plastic waste used to recycle plastic into plastic beans because plastic waste is cheaper than producing new plastic. These developing countries may view plastic waste as a resource that they are ready to buy from other countries (Y. Bai & Givens, 2021). Whereas developing countries like China also contribute the largest amount of plastic waste in the ocean with low recycling rates. In 2020, Indonesia ranked

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second with 10.1% of its total plastic waste dumped into the ocean, equivalent to about 187.2 million tons per year and only about 10% ended up in recycling centers (Hallee, 2021; Oktavilia et al., 2020). According to " The World Bank' s Indonesia Marine Debris Hotspots Rapid Assessment", one-fifth of all plastic pollutants in Indonesia are estimated to end up in rivers and oceans (World Bank, 2018). At this rate, it is estimated that by 2050, the oceans will be home to more plastic than the total weight of fish (World Economic Forum, 2016).

The use of plastics in Indonesia today has spread to every aspect of social life, most of which are single-use, which means that the intrinsic and economic value of the material is lost once it is discarded (Suhardjono et al., 2021). Suhardjono et al. (2021) also mentioned that of the 175,000 tons of waste that Indonesians throw away every day, around 24,500 tons are made of plastic, unfortunately, more than 80 % of Indonesia's waste is not segregated making it very difficult to recycle. As a result, Indonesia is currently facing a waste crisis both on land and in the ocean. This waste reaches the rivers due to the low awareness of Indonesian people on waste management, as well as ineffective regulations and law enforcement in Indonesia (Hallee, 2021). With Indonesia's population of approximately 280.3 million (Worldometer, 2022), divided into several communities with different cultural backgrounds, it is very difficult to raise public awareness of the need to separate, reduce, reuse and recycle waste. In addition, in terms of geographical location, Indonesia is spread over more than 17 thousand islands, which poses many challenges for the government to implement laws and regulations in each island or region. Moreover, every island in Indonesia is surrounded by ocean, which exacerbates plastic pollution in the ocean and marine ecosystem.

The risks arising from plastic waste pollution in Indonesia are environmental degradation risk, health risk, food security risk, biodiversity risk, and economic risk. The biggest risk when Indonesia does not immediately address plastic waste pollution is the risk of environmental degradation that can lead to loss of biodiversity. Shahab (2021) stated that Indonesia has some of the most diverse and important coral reef systems in the world but over the past few decades, these habitats have faced a number of challenges, including plastic pollution. In addition, as the amount of plastic waste polluting marine waters increases, the risk of marine species dying from ingesting the waste also increases (Rarasati & Pradekso, 2019). Rarasati & Pradekso (2019) also revealed that when microplastics enter the bodies of marine animals, it can tear the intestines and disrupt digestive functions, which can ultimately lead to death.

In the international legal framework, plastic-related issues are regulated through various treaties, including the Basel Convention, Marpol Convention, and Stockholm Convention. However, some of these treaties are still considered unable to comprehensively address the plastic challenge (Suriyani, 2019). In general, there Iis no comprehensive international regulation on plastic waste. Existing regulations are only at the country or regional level. In addition to existing national conventions & national regulations, the Sustainable Developments Goals (SDGs) are global and national commitments that must be achieved by 2030. SDGs are also a crucial aspect that must be considered in efforts to reduce the amount of plastic waste in Indonesia. This is due to the complexity of the plastic waste management problem which involves diverse sectors and has a significant impact on society and the economy(Aminah & Muliawati, 2021).

The article aims to compare the existing plastic waste management systems in Indonesia and the Netherlands to highlight the best practice of waste management in the Netherlands with the application of circular economy (CE). This is important as knowledge to tackle plastic

pollution and release the Indonesian economy from the grip of the plastic waste trade. This is because the Netherlands is one of the countries with an efficient waste management system. As such, this research aims to contribute an integrated analysis of the growing global discussion on challenges through the sociological perspective of developing and developed country relations followed by responses to plastic pollution, as well as offer a perspective of legal and policy legitimacy that can be taken from the Netherlands to be applied in Indonesia.

As such, this article will focus on the political ecology of the plastic industry in the Global North and Global South relationship to better understand the plastic waste trade. Furthermore, it compares policies on existing regulations in the international realm, the Netherlands and Indonesia. Finally, this article contributes lessons learned for the future gathered from the author's participation in developing policy-making processes in developing countries especially Indonesia and highlights gaps in knowledge for future research. Research on lessons learned f rom countries that have successfully managed plastic waste is necessary, especially for GS countries such as Indonesia. That is because densely populated countries like Indonesia must reduce the amount of waste pollution that exists or the goal of a good and healthy environment as mandated by the 1945 Constitution will not be fulfilled.

RESEARCH METHOD

The research in this article addresses the juridical and socio-political aspects of the plastic waste problem simultaneously. The juridical study examines the relevant legal norms, both in the context of international and national regulations. Meanwhile, the socio-political study analyzes the social and political factors that influence the issue, such as government policies, public awareness, and political interactions.

The research method used is qualitative, by collecting and analyzing secondary data from various sources such as books, journals, and websites. One example of the data that the author uses is a journal by Bai, Y., & Givens, (2021) on "Ecologically unequal exchange of plastic waste? A longitudinal analysis of international trade in plastic waste" as well as other journals and secondary data that are still related to the issue of plastic waste. The existing data is examined descriptively to understand the issue of trade and waste pollution. In addition, the research also compares existing legal systems to provide useful insights for other countries dealing with similar issues. This article provides a comprehensive overview of the complexity of the plastic waste problem from various perspectives.

RESULTS AND DISCUSSION

Plastic Waste and its Complexity

Since 1950, global plastic production has increased at an annual growth rate of about 8.4%. In 2018, plastic production reached 360 million tons, with projections that this figure will increase to 500 million tons by 2025(B. Bai et al., 2019).

Plastic waste pollution has become a major environmental problem worldwide(Wang et al., 2022). Every year, about 415 million tons of plastic are produced globally (Azoulay et al., 2019). Middle- and lower-income countries do not have sufficient plastic waste management, so 90% of plastic waste is disposed of in an unscientific and inappropriate manner(Ritchie et al., 2020). In addition, between 1950 and 2015, 79% of plastic waste was reported to be poorly managed (Maitlo et al., 2022). This means there are 5 billion tons of plastic waste in land fill sorthe environment. The cumulative amount of plastic produced is expected to reach 34 billion tons by 2050 (Maitlo et al., 2022). Based on current consumption rates, plastic waste In land fills or the environment will reach 12 billion tons (Maitlo et al., 2022). About 36% of plastics are used for packaging, 16% for

construction, 15% for textiles, 10% for consumer products and institutional products, and the remaining 33% for transportation of electronic and industrial products (Maitlo et al., 2022). Recycling of plastic waste is almost 14-18%. From the recycling process, 24% of plastic waste is managed for energy recovery, and the remaining 58-62% is directly disposed of in landfills(Geyer et al., 2017). Due to poor global waste management policies, approximately 10-12 tons of non-biodegradable hazardous plastic waste is discharged into water areas (Hu et al., 2021). It is also estimated that 1.2-2.4 tons of plastic waste enter the ocean from rivers every year (Maghsodian et al., 2022). According to data presented by UNESCO, more than one million birds and more than a thousand marine species are estimated to die each year from ingesting or being trapped by plastic waste(World Heritage Centre, 2023). Plastic ingested by animals cannot break down in the stomach, which disrupts metabolism and causes death.

Source: One Green Planet, (2021)

Figure 1
A Sea Turtle with Plastic Waste in Its Mouth

The figure above shows that plastic waste in the environment can disrupt animal ecosystems and can cause death. Apart from the oceans, plastic waste can also disrupt land ecosystems. One example is the increasingly alarming situation at the Bantargebang Integrated Waste Management Site in Indonesia. The pile of garbage in Bantargebang is getting higher and higher over time, even as high as a building equivalent to 16 floors (Herdiantoro & Pratiwi, 2023). This happens because plastic is widely used in Indonesia for various purposes, such as shopping bags, drinking water bottles, coffee cups, straws, food packaging, and so on. The majority of this plastic packaging is disposable, so its intrinsic and economic value is lost once it is used and discarded. Suhardjono et al. (2021) also mentioned that of the 175,000 tons of waste thrown away by Indonesians every day, around 24,500 tons of it is made of plastic. Unfortunately, more than 80% of the waste in Indonesia is not segregated, therefore the existing waste cannot be processed and recycled due to obstacles from mixing all types of waste (Suhardjono et al., 2021).

The Dynamics of the Global South and the Global North: Cross-Border Movements According to Kowalski(2021), if one wants to understand the GN-GS relationship then one needs to understand the place of the global south in the global political economy. In the global political economy, Kowalski(2021) argues that the south occupies an inferior position because it is vulnerable to the interests and actions of the GN, especially regarding the hazardous waste trade. Islam (2020) notes that the transfer of hazardous waste from rich countries to developing countries seems feasible. However, in reality, it is "not true" as developing countries sometimes lack the financial and physical resources to effectively manage hazardous waste and protect their environment and public health. Despite the creation of the Basel Convention- which is further supported by national regulations and policies - hazardous waste sites remain and disposal continues. Therefore, Yang (2020) criticized the Basel Convention for being ineffective and allowing this trade to continue. The Basel Convention allows GS to prohibit the dumping of hazardous waste in their territory. However, in reality, there is still a cross-border trade in plastic waste.

Waste export from GN countries to GS is not a new phenomenon. Environmental justice experts state that wasteful consumption patterns and rapidly obsolete products have created

overconsumption in GN and generated large amounts of waste that is often dumped in GS (Gregson et al., 2015). Environmental and health burdens are unequally distributed when developed countries 'contaminate' developing countries by shipping polluting substances and materials that cause environmental damage and put populations in developing countries at high health and environmental risk. In the last 30 years, global plastic production has increased by 200% with global generation of approximately 335 million tons of plastic in 2016 (Plastics Europe, 2022).

In 2017, Asia accounted for 50% of global plastic material production followed by Europe with around 20%. With economic growth in a number of Asian countries, their demand for plastic materials is increasing, which is driving plastic exports from Europe to these destinations. Industrialized countries do not process the plastic waste and industrial waste they generate themselves due to the high cost of processing, especially if the waste contains hazardous and toxic materials. The easiest way is to export these waste problems to importing countries. This way, they can reduce the pollution and environmental damage that occurs within their country.

Source: Interpol, (2020)

Figure 2
Transboundary Plastic Waste Movement, World Scale

As seen in the figure, GN countries send their waste to Asian countries or GS. In early 2018, the Chinese government imposed a permanent ban on plastic waste imports to address environmental damage from the global plastic trade (Brooks et al., 2018). At first, GN countries were not prepared for the situation, but they found a way to shift the responsibility, risk, and burden back to the South by redirecting plastic waste exports to other Southeast Asian countries including Indonesia '(Reeves, 2019).

Transactional Issues of Capitalism Products (Socio-Economic Analysis) Amuzu (2018) points out that waste can be directly linked to the production and consumption of global capitalism. Plastics are produced in such a way as to break down and encourage repetitive consumption which results in tremendous amounts of plastic waste. Furthermore, he discusses the implementation of national policies to bridge the so-called digital divide between GS and GN resulting in an overflow of imported plastic waste driven by the 'cheap' economy of Western societies to GS societies. In other words, local and international ideas related to capitalism and development strongly influence the situation in GS.

T he degradation of nature and the people who work and live in Indonesia can be seen from Marx's 'law of value' and Moore's 'law of cheap nature' (Jansen & Jongerden, 2021). Moore's (2016) law of cheap nature stems from the idea that capitalist systems need to generate production through increased flows of 'cheap' things like food, labor, energy, and raw materials in order to reduce socially necessary labor time through the reality and politics of the current crisis. Much of what is described as nature is essentially a fundamental aspect of capitalism's value, in other words, the law of value in capitalism is simultaneously the law of 'Cheap Nature'.

In Indonesia, plastic waste collection is managed by both the formal and informal sectors, accounting for approximately 39% of the total plastic waste that reaches end-of-life (EOL). The formal sector involves registered companies and government agencies that provide waste collection services, while the informal sector consists of individuals

and groups that are not formally registered but are involved in collecting potentially recyclable waste from various sources such as households, streets, and landfills. The formal sector collects almost four times as much plastic waste as the informal sector. Most of the plastic waste collected by the formal sector is sent to sanitary landfills, with an estimated only 1% being recycled. On the other hand, all plastic waste collected by the informal sector is sent for recycling. Most of the recycling process is mechanical recycling (Putri et al., 2018). However, recycling efforts in Indonesia are driven by the informal sector. In addition, there is a lot of mismanagement of plastic waste in Indonesia, either through landfills, open dumping, or open burning (Neo et al., 2021).

Cheap capitalism against Indonesia exists because in addition to its inequality between the formal and informal sectors, Indonesia still needs imports of plastic waste for industrial raw material needs. According to data from Comtrade United Nations, imports of plastic waste from around the world, which are classified as waste, prunings, and plastic scrap, have increased rapidly since 2010 and reached a peak of 320 thousand tons in 2018. At the Hearing Meeting with Commission IV of the House of Representatives, the Director General of Waste, MoEF, stated the truth. In the conference. The Director General of Chemical, Pharmaceutical, and Textile Industries of the Ministry of Industry, also mentioned how the recycling industry depends on imported waste because domestic raw material supplies are still scarce. As an illustration, he stated that only 30% of the domestic plastic recycling industry needs could be met by local recycled raw materials, while the remaining 70% had to be imported from abroad. As a record, Indonesia has 60 plastic recycling companies with a total capacity of approximately 1.1 million tons, which absorbs the workforce of about 20,000 people. Therefore, if the temporary purchase of scrap or recycled raw material is not smooth, it will affect the capacity to unemployment 1.1 million tonnes with an investment value of almost 7 trillion. Furthermore, the export potential disappears around $800 million, and there i s also a possibility of termination of employment for the workers.

Plastic waste regulations at international level

At the international level, there are several international agreements aimed at reducing plastic pollution. The United Nations Convention on the Law of the Sea (UNCLOS) informs States of their obligations to protect the marine e n v i r o n m e n t . T h e I n t e r n a t i o n a l Convention for the Prevention of Pollution from Ships (MARPOL) prohibits vessels from dumping plastic into the sea, while the Stockholm Convention prohibites the use of certain chemicals. (Plastic Soup Foundation, 2017). Meanwhile, the Basel Convention on Transboundary Shipments of Waste 1989 prohibits cross-country trade in toxic waste. A total of 187 countries have taken a major step in dealing with the plastic trade crisis by including plastic in the scope of the Basel Convention. This convention aims to control the movement of hazardous waste from one country to another, especially from developed countries to developing countries (Suriyani, 2019).

In addition to these conventions, there is the Convention on Biological Diversity (CBD) which focuses on protecting biodiversity from existing plastic pollution. So far, there is no international agreement that makes plastic garbage a starting point, although UN member states recognize that this problem can only be over come through international cooperation (Plastic Soup Foundation, 2017). While there are proposals for a Global Plastic Treaty that will regulate plastic waste trade, reducing plastic pollution and managing plastic waste, the concept is under discussion in international forums and has yet to reach agreement. In essence, there is not a single convention concerning plastic waste that has been made fully and unified on the

handling of plastic waste at the international level.

In addition to some international agreements, there are other principles of international law known as the Sustainable Development Goals. (SDGs). This principle aims to continuously improve the well-being of the people and maintain the continuity of the social life of the community. In this case, the waste management is an important point in some of the pillars that exist in the SDGs:

a. Pillar No. 3 on Healthy Living and Welfare
b. Pillar No. 6 on Clean Water and Decent Sanitation
c. Pillar No. 11 on Sustainable Cities and Settlements
d. Pillar No. 12 on Responsible Consumption and Production
e. Pillar No. 13 on Climate Change Management
f. Pillar No. 14 on Marine Ecosystems
g. Pillar No. 15 on Land Ecosystem

Regulations on Plastic Waste in the Netherlands

Based on "European Directives" on packaging and packaging waste, packaging producers are responsible for separating and recycling plastic packaging wastes (Gradus et al., 2017). Directive (EU) 2018/852 is the last amendment to Directive 94/62/EC and contains the latest measures designed to: prevent the production of packaging waste, and promote re-use, recycling, and other forms of recovery. This directive has been enacted which requires EU countries to take measures , such as national programmes, incentives through the Extended Producer Responsibility scheme, as well as other economic instruments, to prevent the formation of package waste and minimize the environmental impact of the packaging. Gradus et al also mentioned that in the Netherlands, a company called "Green Dot" is responsible for fulfilling this legal obligation (Stichting Afvalfonds Verpakkingen, called as Afvalfonds). The company collects financial contributions paid by the retail and packaging industries (based on the volume of plastic garbage) and provides compensation to the city government, which in the Dutch system is mandated by the Afvalfonds to collect household plastic waste. The Netherlands has enforced this European law strictly so that by 2014, 50% of plastic (packaging) has been successfully recycled.

In addition to the "European Directives" on packaging and packaging waste, at the regional level they also have "SUP-Directives" namely Directive (EU) 2019/904. SUP is the abbreviation for Single Use Plastics, in other words, plastic that is only used once and then discarded. To reduce plastic soup, the European Commission has drawn up a directive on reducing the impact of certain plastic products on the environment (Plastic Soup Foundation, 2017).

The significant impact of environmental damage on public life has prompted the Indonesian state to establish rules in the country's constitution (Puluhlawa & Puluhlawa, 2021). The recognition of the right of every citizen to a good and healthy living environment is contained in article 28H paragraph (1) of the Constitution of the Republic of Indonesia of 1945. It can be widely understood that a good and healthy living environment is an environment without the presence of plastic waste pollution in it. Moreover, Indonesia has a complex legal pluralism structure because there are several levels of regulation governing plastic garbage in Indonesia, namely national regulations, government rules, presidential rules, ministerial rules, and also regulations at the regional level.

At the national level, there are the Law No. 18 of 2008 on Waste Management, the Act No. 32 of 2009 on the Protection and Management of the Environment, the Law Number 32 of 2014 on the Sea. At the governmental level there are Government Regulations No. 21 of 2010 on Protection of the Maritime Environment and the Government Regulation No. 81/2012 on the Management of Household Waste and Homemade Waste. Although this

regulation is very general about the type of garbage, the law consists of the CE scheme, the concept of extended manufacturer responsibility in relation to plastic packaging that must be returned to the company that produces the packaging of the product.

In addition, at the level of presidential regulations there is Presidential Decree No. 83 of 2018 on Marine Waste Management. Later, on ministerial decrees, Indonesia has a law in the Decree of the Minister of Environment and Forestry No. P.75/2019 on Waste Reduction Roadmaps by Manufacturers. In addition, Indonesia also supports the SDGs, in particular the 12th principle, which is responsible consumption and production, and it is also supporting the zero waste programme.

Although there have been many legislative regulations to resolve the existing problem of plastic garbage, the reality is that Indonesia is still struggling to tackle plastic waste pollution on land and at sea. There are many factors that make Indonesia a state of plastic waste emergency. This is due to the lack of awareness of the public in disposing of garbage at the right place, the non-availability of integrated waste disposal systems, the public's consumer tendency towards disposable packaging products, the geographical complexity of Indonesia's many islands hindering the implementation of comprehensive plastic waste management schemes, and weaknesses in the enforcement of existing environmental laws.

The Paradox of Plastic Waste

The socio-political phenomenon of the plastic garbage trade presents a rather complex paradox. On the one hand, these plastic garbage trading activities provide mutualistic economic benefits for both GN and GS. GN as a plastic waste producer will benefit from the sale of plastic waste to countries in GS, while GS will gain from the processing of such plastic waste into goods of economic value, such as plastic seeds or fuel as well as a lot of jobs. However, on the other hand, the trade in plastic garbage also has a negative impact on the environment. The shipment of plastic garbage from GN to GS is often carried out illegally and does not meet international standards in waste management. This has caused many countries in the GS to be exposed to the negative impact of such plastic waste, such as environmental damage, public health, and social damage.

Source: Liu et al, (2022)

Figure 3

GN and GS Plastic Waste Dependency Flow

From an environmental law perspective, the trade in plastic waste also Violates various international environmental regulations and conventions, such as the Basel Convention. It prohibits the shipment of hazardous waste from developed countries to developing countries without the permission of the recipient country. Therefore, although the trade in plastic garbage provides economic benefits for both parties, but from an environmental law point of view, this activity is clearly unjustifiable. A comprehensive and sustainable solution is needed to deal with this problem, both through the improvement of the GN waste management system, as well as the increase in the waste processing capacity in GS.

The idea of getting out of the chain of dependency of GN-GS plastic garbage trade is very much needed. Indonesia can be inspired by the best practices of the Netherlands because it is known to be one of the advanced countries that has managed plastic garbage well and has technology that is focused on waste

treatment. In addition, Indonesia also needs to advance the formal and informal sectors related to garbage management. The government can provide support in the form of incentives and support facilities to local entrepreneurs who want to move in the field of waste management, whether in terms of collection, processing, or recycling of plastic waste.

Whereas for the informal sector, the government may provide training and support in form of market access and technology to help waste management at the community level, such as through waste collection programmes in households or villages. In addition, Indonesia also needs to implement a firm policy on plastic waste management, such as banning imports of plastic waste from other countries, as well as increased oversight of domestic plastic garbage management. This will help improve the quality of waste management in Indonesia and reduce the negative impact of the plastic garbage trade.

Intervention and Best Practice Global North (Lessons Learned from Netherlands)

The author will provide some analysis related to interventions to address the problem of plastic waste management in Indonesia. These interventions could include policies such as understanding the Circular Economy (CE), Extended Producer Responsibility (EPR) and Deposit Refund System (DRS), investing in recycling infrastructure, and educating the public about the importance of waste reduction and proper waste management. This intervention requires collaboration between government, industry, and the public to a sustainable solution to the plastic garbage problem in Indonesia. Through these actions, the author hopes to contribute to the efforts to address the problem of plastic waste management and strive to create a sustainable living environment.

When CE was recognized as a solution to sustainable development, the concept of "new plastic economy" was proposed and incorporated into the CE strategy to address the environmental problems caused by consumer production, and plastic disposal (Wang et al., 2022). Wang also revealed that the new plastic economy aims to reduce waste, maximize value, and use plastic efficiently by recycling, as well as the redistribution of recycled goods for reuse.

Source: Waste4change, (2023)

Figure 4
CE System

CE is basically an idea that drives the transformation of linear processes into circular processes, involving reduction, reuse, recycling, management, collection, and circulation (Jang et al., 2020). CE can contribute to three important aspects of being able to boost productivity and boost economic growth, improve the quality and quantity of labor, and help save lives by reducing environmental impacts such as air and water pollution and climate change (Murti et al., 2022).

South Korea (60%), the Netherlands (57%) and Taiwan (51%) are examples of countries with best practices that have successfully recycled their plastic garbage(Murti et al., 2022). In order to move towards CE in 2015, the European Commission proposed the first Circular Economy Package and continued with the second circular economy package in 2018 (Robaina et al, 2020). The package sets out a programme of action and concrete measures to drive Europe's transition to CE (Murti et al., 2022). However, these conditions are at best compared to the realities in Indonesia. In Indonesia, plastic

waste accounts for 15% of total garbage and is still not properly managed despite various policies that have been implemented.

On the other hand, waste management policies such as EPRs using DRS schemes are considered best practices in many countries, and Indonesia can take valuable lessons from them to improve waste management systems. By using efficient market-based tools can drive modifications on the plastic value chain that support sustainability. Waste management costs can be borne by the deposit refund policy (DRS) and the EPR which can also help develop a market for goods that reduce waste or are easy to reuse or recycle (Schwarz et al., 2021).

Waste management is closely linked to the discussion of EPR as an important component that can be done to minimize existing plastic garbage. The EPR describes the legal obligation of producers to pay for increased pollution from plastic products produced, such as environmental externality, and thus partially transfer responsibility for waste management to producers . This mechanism motivates manufacturers to spend money on environmentally friendly product designs to increase opportunities for recycling and product collection. Plastic packaging is the most common EPR place, but they are also necessary for electronic and electrical devices (Schuyler et al., 2022). The most popular methods for dealing with EPRs are a take-back agreement, a deposit/return policy or DRS, and an advance disposal fee. (ADF). The majority of implementing the EPR collaborate with or are part of a producer's responsibility organization (pro) because the realization of EPR requires efforts from governments, city authorities, as well as various producers and importers. (OECD, 2016). In addition to the US, Canada, and the European Union, many other countries are developing regulations related to EPR. The price differentiation for good goods (reusable or recyclable) versus bad goods or packages can be achieved by combining EPR with environmental modulation.

Source: Dimitropoulos et al., (2021)

Figure 5
EPR Scheme

A common tool that allows for a separate collection of bottles, drink card boxes, and cans is DRS. DRS is used in many Western countries and can be an EPR component . Consumers are encouraged to return the waste to the disposal site by adding additional costs to the goods. It shifts financial responsibility to the end consumer, which has proven to be successful in Europe at a rate of almost 90%, making it one of the most effective tools to combat plastic leaks into the ocean and the environment. Drinking containers in water can be reduced by up to 40% using DRS(Schwarz et al., 2021).

I mplementing the EPR policy through the DRS scheme in Indonesia can help address the waste management challenge in the country. Indonesia already has a similar system called the Waste Bank, but it has not been able to motivate consumers to collect their garbage back to the producers. Therefore, an EPR with a DRS scheme can encourage manufacturers to design more recyclable products that can help reduce the amount of waste generated. Moreover, it can motivate producers to invest in recycling infrastructure that can create new jobs and support the growth of the recycled industry in Indonesia. DRS can also help increase recycling rates and reduce garbage in Indonesia. Deposits on beverage containers can encourage consumers to return their used container for recycling which can reduce the amount of waste pollution.

The EPR policy through the DRS scheme is a prospective waste management strategy, which can help Indonesia overcome its waste management challenges. By implementing the policy, Indonesia can encourage producers and consumers to take responsibility for their waste, increase recycling rates, and reduce waste pollution together.

In addition, the following are the steps taken by the Netherlands that can be inspired to be implemented in Indonesia in managing plastic waste under the umbrella of the SUP-Directives legislation implemented by the Dutch.

1. First, prohibit certain kinds of products. As of July 3, 2021, certain products - with the exception of existing stocks - can no longer be sold.
2. The Netherlands also strictly applies the EPR scheme. The EPR applies to some products such as wet fabrics; balloons for consumers; tobacco products with separate filters and filters; food packaging, including fast foods or foods that can be eaten directly; bags and packaging for food ingredients; drink packaging and composite beverage cartons up to 3 litres and drink cups including covers; and for thin embedded bags (Plastic Soup Foundation, 2017). The policy on EPR in Indonesia has actually been enforced in the Waste Management Act, in particular in Article 1 which reads: "Producers are obliged to take care of packaging and/or goods produced by them that cannot or are difficult to break down by natural processes" (Murti et al., 2022). Although this article does not directly mention EPR, the existence of such legislation is a legal basis to affirm the role and responsibility of producers in efforts to reduce and manage waste. However, in practice, this EPR scheme has not been fully implemented effectively in Indonesia.
3. The third is the labelling requirement. The mandatory labeling requirement on the packaging indicates that a product contains plastic, that the product must be disposed of at home and that the garbage has a negative impact on the environment (Plastic Soup Foundation, 2017)..
4. The fourth is the reduction of consumption where the use of plastic drinking glasses and food packaging used while travelling should be significantly reduced. Multi-purpose alternatives may be offered or packaging is not provided for free. Generally speaking, the idea is to give a price to products that are free, require reuse, and prohibit certain products in certain places (Plastic Soup Foundation, 2017).
5. Fifth, product requirements, plastic bottles must be made of recycled material, at least partially. Starting in 2024, bottle lids and lids will have to be installed on plastic bottles and beverage packaging, thus automatically recovering the bottle and packaging for recycling (Plastic Soup Foundation, 2017).
6. To ensure that at least 77% of all plastic bottles up to 3 liters will have to be collected by 2025 (and at least 90% by 2029) for recycling, the deposit system for all three liters of bottles will be implemented by the end of 2021. Starting in 2023, the target for collecting fishing gear is 23%, and after that it will be increased by 3% annually (Plastic Soup

Foundation, 2017).

7. Consumers gain information about the environmental impact of plastics. It relates to information on such issues as reusable alternatives and proper disposal of garbage (Plastic Soup Foundation, 2017).

The Netherlands is also of concern because they have a complete and adequate waste management infrastructure that can recycle large amounts of waste and make use of waste into energy (Murti et al., 2022). This is because the Dutch Economic Action Plan focuses on plastic waste management, forms an institution that ensures producers are responsible for recycling their products (similar to the EPR) and is complemented by established policies (Murti et al., 2022).

Basically, the implementation of CE nor any other measures taken by the Netherlands will not necessarily be properly implemented in Indonesia. This is because Indonesia has a very large population, approximately 273.52 million. (Annur, 2023). In addition to its large population, Indonesia's geographical location is also an obstacle to connecting a program or scheme in an integrated way. This is because Indonesia is an island state so it is a special challenge when it comes to accommodating the transport and communications systems necessary for managing this plastic garbage. However, with a little adjustment then some measures are possible to be implemented in Indonesia to reduce the pollution of plastic waste that exists in the oceans and on land.

Lack of Plastic Waste Management System in Indonesia Indonesia still needs to pay attention to some policies and regulations related to existing plastic waste management. This is because:

1. There is no comprehensive ban on single-use plastic products. Plastic bags, plugs, and styrofoam are still in use, polluting the environment and threatening marine life. In addition, at the regional level, there are already regulations to ban plastic bags and plastic bags, such as: Governor's Decree of Bali No. 97/2018 and Governor of DKI Jakarta No. 142/2019 to ban the use of single-use plastic bags.
2. The EPR scheme is not running effectively. The responsibility of manufacturers in recycling their products is still not optimal. There are already some legislative regulations related to the enforcement of both EPR and CE in Indonesia, but the regulations are still generalized so manufacturers can escape their responsibility to manage plastic garbage from their products.
3. Marking or labelling on plastic packaging is not fully mandatory. Consumers do not get clear information about the environmental impact of plastics. Since IndonesIa does not implement a DRS system, labelling on packaging has not been done so consumers are not informed that the packaging can be returned to manufacturers, can be recycled, hazardous when burned and so on.
4. The plastic garbage collection system is still not optimal. The Indonesian people still haven't sorted their garbage because of the lack of infrastructure and disposal. As a result, plastic garbage is thrown into the neighborhood. Therefore, the waste management infrastructure still needs to be improved.
5. Public awareness about sorting up plastics by type and about the dangers of plastics still needs to be raised. Many people have not understood the negative impact of plastic on the environment and health. As well as the lack of

efforts to reduce the consumption of single-use plastics and a lack of affordable alternatives make it difficult for society to get rid of plastics.

SUMMARY

The problem of garbage pollution not only ends in the lack of a country's existing waste management system, but is also affected by the socio-economic and political situation of the country. There's an attractive interest of GN-GS when dealing with plastic garbage. GN believes that sending their plastic garbage to other countries is one of the cheaper ways than recycling, while GS believes they will benefit from the processing of such plastic waste into goods of economic value, such as plastic seeds or fuel and a plethora of jobs. Although GN like the Netherlands are also involved in the trade in garbage, they have many regulations and measures that can be an example for Indonesia, which is a member of the GS, to tackle the problem of plastic waste pollution. Some of the ways that can be done are by implementing the CE scheme which in this case also means implementing EPR concepts, banning the use of single-use plastics, labelling on products that contain plastic, collecting types of garbage separately, raising public awareness and so on. Indonesia can also learn from the Netherlands about the optimal use of DRS systems to encourage people to return their plastic garbage to producers. In addition, the implementation of the concept of EPR in Indonesia is still not running to the maximum, there is no labelling on the packaging that this packaging will be recycled or returned to the producer, the inefficiency of the waste disposal system in Indonesia and the low awareness of citizens to management of waste issues and pollution. Hopefully, Indonesia can take lessons from the Netherlands and what the relationship is going on between the GN and GS member countries so that it is more willing to accept everything and think of appropriate strategies to implement in order to reduce the existing problem of plastic garbage.

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