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Regulatory and Institutional Approach in Tackling Marine Plastic Pollution: The Practice of Indonesia

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Abstract

Marine plastic pollution (MPP) has become a critical global environmental issue, significantly threatening marine ecosystems, biodiversity, and human health. Despite Indonesia's commitment to various international legal frameworks, the effectiveness of its national regulatory and institutional responses remains uncertain due to fragmented policies, weak enforcement mechanisms, and overlapping institutional authorities. This study employs a legal and policy analysis method, examining Indonesia's adherence to international conventions, national regulations, and enforcement mechanisms in tackling MPP. The findings reveal that while Indonesia has ratified key agreements such as UNCLOS 1982, MARPOL 73/78, and the Basel Convention, their domestic implementation remains inconsistent, with no unified legal framework addressing MPP comprehensively. The most effective initiative observed is the single-use plastics (SUP) ban in certain regions, yet the absence of a nationwide standard limits its overall impact. This study contributes to the ongoing discourse on environmental governance by highlighting the gaps in Indonesia's regulatory approach and providing recommendations for strengthening its legal framework and enforcement mechanisms to combat marine plastic pollution more effectively.

Keywords: *Environmental Law, Legal Frameworks, Marine Plastic Pollution Waste Management Policy.*

A. Introduction

Marine plastic pollution (MPP) has emerged as one of the most significant global environmental threats, affecting marine ecosystems, biodiversity, and human health. According to UNESCO, plastic waste is source of 80% of all marine pollution and by 2050 the number of plastic waste will outnumber all fish (UNESCO, 2022). If left unaddressed, MPP

will continue to degrade marine habitats, disrupt food chains, and pose long-term risks to human livelihoods, particularly for coastal communities that rely heavily on marine resources.

International legal frameworks relating to the prevention of marine pollution, including MPP rely on, but not limited to, the United Nations Convention on the Law of the Sea 1982 (UNCLOS 1982) and International Convention for the Prevention of Pollution from Ships (MARPOL) and its Annexes. Article 194 paragraph (1) of UNCLOS 1982 encourages States to take all measures in accordance with the Convention in preventing and reducing marine pollution to protect and preserve marine environment. It further appealed States to harmonize their national policies relevant to this aim (United Nations Convention on the Law of the Sea, 1982). In addition to this, Annex V of MARPOL regulates specifically on the Prevention of Pollution by Garbage form Ships, which include plastic wastes. It prohibited the disposal of all garbage to the ocean, including all kind of food wastes, domestic wastes and operational wastes, all plastics, cargo residues, incinerator ashes, cooking oil, fishing gear, and animal carcasses generated during the normal operation of the ship (International Convention for the Prevention of Pollution by Ships ((MARPOL 73/78), 1997). It is further argued that the increasing amount of plastic wastes is not only generated from high rate of plastic consumption but also from plastic production.

At this point, it is submitted that in the effort in reducing plastic wastes, not only limiting use of plastic is important, but minimizing plastic production is also urgent (UNDP, 2024). Countries with high levels of plastic production and waste generation are at the forefront of addressing this urgent crisis (Evode, Qamar, Bilal, Barceló & Iqbal, 2021). Thus, in 2017, the World Economic Forum and the United Nations Environmental Programme (UNEP) convened a meeting of G20 countries in Hamburg, Germany, this meeting led to the creation of the G20 Action Plan on Marine Litter, which aims to promote further actions to address marine plastic pollution (MPP) while considering the specific policies and approaches suited

to the domestic conditions of each G20 member country (G20, 2017). Regionally, the Association of Southeast Asian Nations (ASEAN) has also recognized the importance of establishing a regional framework to reduce plastic waste (MONRE of Thailand, ASEAN, & IUCN, 2017). Since that time, the international community has developed several legal frameworks, both hard law and soft law, to combat marine plastic pollution.

Although global and regional legal frameworks are important in setting strategies as well as legal enforcement in combatting MPP, the existing national legal frameworks are no less important. Tan argued that national laws provide the enforcement mechanisms necessary to translate international norms into effective action on the ground. Without robust national laws, international conventions risk being undermined (Tan, 2022). UNEP also acknowledged that national legal systems are key to implementing regional and international agreements to combat marine litter and plastic pollution. It emphasizes that countries must adapt international policies to their specific national contexts, including enforcement, monitoring, and compliance (UN Environment Programme, 2021). National laws which in accordance with international legal frameworks are also play vital role in addressing MPP (Pramudianto, 2020). However, at national level often lack of sufficient land-based waste management mechanism, poor environmental awareness, low budget allocations, lack of investment as well as weak law enforcement continue to be major obstacles to tackle MPP (Shuker & Caldman, 2018).

Indonesia faces a complex array of challenges in managing plastic wastes, including rapid urbanization, inadequate waste management infrastructure, and high levels of plastic consumption. On the other hand, as the world’s second-largest contributor to marine plastic waste, Indonesia's role in combating this pollution is critical, both regionally and globally (van Truong & beiPing, 2019). Despite these obstacles, Indonesia has made notable strides in developing regulatory and institutional frameworks aimed at tackling plastic waste, both at the national and local levels. The government has launched ambitious initiatives, such as the

National Action Plan for Reducing Marine Plastic Waste, and has committed to significant targets for reducing plastic waste by 2030. However, the effectiveness of these measures is still subject to debate, given the challenges of enforcement, inter-agency coordination, and the involvement of multiple stakeholders.

This study employs a normative method, focusing on a juridical approach to analyze Indonesia's regulatory and institutional framework in tackling marine plastic pollution (MPP). The research is conducted through doctrinal legal analysis, examining primary legal sources such as international treaties (UNCLOS 1982, MARPOL 73/78, Basel Convention), national legislation (Indonesian Act No. 32/2014 on Ocean Affairs, Law Number 32 of 2009 on Environmental Protection and Management amendment to Law No. 6 of 2023 on the Enactment of Government Regulation in Lieu of Law Number 2 of 2022 on Job Creation into Law), and governmental regulations related to MPP governance. Additionally, comparative legal analysis is utilized to evaluate Indonesia's legal approach in relation to global and regional frameworks, including ASEAN's initiatives on marine debris. The study also incorporates a policy analysis to assess the effectiveness of Indonesia's enforcement mechanisms, institutional coordination, and policy implementation. Secondary sources such as reports from international organizations (UNEP, UNESCO), journal articles, and expert opinions are reviewed to support the legal and policy evaluation. By integrating these methods, this study aims to identify gaps in law enforcement, inconsistencies in regulatory mechanisms, and potential improvements for Indonesia's strategy in mitigating marine plastic pollution.

This article examines Indonesia's regulatory and institutional approaches in tackling MPP. By analyzing key policies, legal frameworks, and institutional mechanisms, it aims to provide a comprehensive understanding of Indonesia's strategy and evaluate its effectiveness in addressing the root causes of plastic pollution. Additionally, the paper explores the roles of both public and private sector actors, the engagement of civil society, and Indonesia's

participation in regional and global efforts to combat marine debris. Through this analysis, the article contributes to the broader discourse on marine plastic pollution governance, offering insights and lessons that may benefit other countries facing similar challenges.

B. RESULT AND DISCUSSION

1. Marine Plastic Pollution: Harm to the Marine Environment

Plastic serves as the primary material for a wide range of equipment and goods used by humans, both in daily life and on a larger scale, primarily due to its low production costs (Halden, 2010). Mitigating marine plastic pollution requires comprehensive and coordinated international regulatory efforts. Recent studies highlight the significant risks posed to marine ecosystems and biodiversity, necessitating collaborative strategies across multiple jurisdictions, particularly in high seas areas (Clark et al., 2023; , Nielsen et al., 2023). The European Union has established frameworks, such as the Marine Strategy Framework Directive (MSFD) and the Water Framework Directive (WFD), to manage marine and aquatic resources effectively (Troya et al., 2022). Despite these legislative efforts, the challenge remains acute, with a vast majority of plastic waste ending up in landfills and marine environments due to insufficient recycling and waste management policies (Zhang et al., 2020; Borrelle et al., 2020).

Moreover, innovative approaches, such as Extended Producer Responsibility (EPR) and improved recycling technologies, are essential to create a circular economy for plastics ("Unraveling The Impacts Of Ocean Plastic Pollution And Strategies For Effective Mitigation", 2023). Policymaking must incorporate diverse stakeholder perspectives to prioritize effective governance and compliance, especially in regions heavily impacted by plastic pollution (Putri & Sabatira, 2023; , Khan, 2021). Ultimately, addressing plastic pollution demands a multifaceted approach that integrates scientific research, regulatory frameworks, and public

engagement to facilitate sustainable practices globally (Prisandani & Amanda, 2019). Many marine animals are drawn to colorful plastic waste that enters the ocean and mistakenly consume it (Kühn, Bravo Rebolledo, & van Franeker, 2015; de Stephanis, Giménez, Carpinelli, Gutierrez-Exposito, & Cañadas, 2013). According to the United Nations, at least 640 marine species have been found to contain plastic within their bodies (Reddy, 2018).

Plastics can attach to marine animals, disrupting their digestive and reproductive systems, leading to permanent disabilities and even death, which threatens marine biodiversity. Over time, plastics break down into microplastics, which pose severe risks to marine organisms and ultimately to humans if seafood and drinking water sources become contaminated (Cole, Lindeque, Halsband, & Galloway, 2011). Health issues linked to microplastic contamination range from cancer and reproductive disorders to developmental imbalances in children and immune dysfunction (Galloway, Cole, & Lewis, 2017). The World Wide Fund for Nature (WWF) Indonesia further reports that 25% of marine biota contains microplastics—plastic particles smaller than 5mm—which may indirectly pose risks to human health through the consumption of contaminated seafood (Azharil, & Paskah, 2023).

MPP also presents a significant socio-economic threat, particularly to coastal states. Many coastal states rely on activities such as aquaculture, fisheries, and tourism, making them highly vulnerable to the adverse impacts of MPP, which can disrupt these sectors and reduce the economic benefits derived from fishing in coastal waters (Newman, Watkins, Farmer, ten Brink, & Schweitzer, 2015). Furthermore, MPP poses hazards to maritime navigation. Discarded fishing nets, ropes, and other fishing gear in the open sea can obstruct vessel operations, forcing ships to halt their activities to remove entangled plastics from propellers and rudders. Additionally, plastic waste, including plastic bags, contributes to blockages and other issues in water pipeline systems.

In sum, unfortunately, the impact of MPP in marine environment unlikely to be resolved in near time. This is because unlike other pollutants, plastic is non-biodegradable and has been present to marine environment for a very long time over and over (Thushari, Senevirathna, 2020). Thus, Thompson argued that even if plastic waste is reduced or even stopped, the concentration of microplastics in the ocean will continue to increase because marine pollution by plastic waste has occurred over decades (Thompson, 2015). However, States have work hard and deploys all of their capacity in combating MPP either in global, regional as well as national level.

2. Indonesian Implementation of International Legal Framework addressing MPP

As previously mentioned, addressing MPP requires the formulation of a comprehensive and robust national legal framework. While states have agreed to certain international conventions, their provisions must be incorporated into national law to become operational. The process of transforming international law into domestic legislation varies and depends on a country's legal traditions, constitutional framework, and its approach to the interaction between international and national law (see further: François, 2020; Lautherpacht, 2021).

Two dominant theories govern the relationship between international and domestic law: monism and dualism (see: Shaw, 2017). According to the monist perspective, international law and national law form a unified system, meaning that international law automatically becomes part of the national legal framework and can be directly applied by domestic courts (see: Shaw, 2017). In contrast, the dualist approach views international and national law as separate and distinct systems, requiring the enactment of domestic legislation before international law can take effect within a state's legal framework. Consequently, under the dualist system, the ratification of an international convention by the national legislature is necessary for its provisions to be enforceable domestically (Shaw, 2017).

In case of Indonesia, although Indonesian Constitution envisages that international convention needs to be ratified, however, there is no provision providing the application of international convention in the national legal system. Indonesian Act number 24 of 2000 relating to International Agreement only provides which international agreements are ratified by Act and which are ratified by Presidential Decree according to its substances. Puspitawati and Kusumaningrum argued that there is no consistency on whether Indonesia holds monism or dualism system in relation to the interaction between international law and national law (Puspitawati & Kusumaningrum, 2016). This condition often resulted to the differences in the application of international convention domestically.

Although no specific international convention exclusively regulates MPP, several international agreements pertain to the protection and preservation of the marine environment, to which Indonesia is bound. The following section examines how international legal frameworks related to marine environmental protection have been incorporated into Indonesia's national laws, particularly in the country's efforts to combat MPP. It also analyzes the challenges Indonesia faces in establishing regulatory and institutional measures to address MPP effectively. Before delving into Indonesia's implementation of international legal frameworks on MPP, the list below outlines the international agreements Indonesia has ratified in this regard:

Table 1: Indonesia's ratification on International Legal Framework Addressing MPP

No	Hard Law	Ratification and Implementation
1.	UNCLOS 1982	Ratification: Indonesian Act Number 17 Year 1985 Implementation: Indonesian Act Number 32 of 2014 on Ocean Affairs; Government Regulation Number 19 of 1999 concerning

		Control of Marine Pollution and/or Destruction; Indonesian Law Number 32 of 2009 on Environmental Protection and Management amendment to Law No. 6 of 2023 on the Enactment of Government Regulation in Lieu of Law Number 2 of 2022 on Job Creation into Law
2.	MARPOL 73/78	Ratification: Presidential Decision Number 46 of 1986 (on MARPOL); Presidential Regulation Number 29 of 2012 on Annex III, IV, V and VI of MARPOL 73/78; Implementation: Government Regulation Number 19 of 1999 concerning Control of Marine Pollution and/or Destruction; Indonesian Act Number 17 Year 2008 on Navigation and its amendment; Minister of Transportation Regulation Number KM 4 of 2005 concerning Prevention of Pollution from Ships; Government Regulation Number 21 of 2010 concerning Marine Environmental Protection; Minister of Transportation Regulation Number 29 of 2014 concerning Prevention of Marine Environmental Pollution
3.	Basel Convention	Ratification: Presidential Decree 61 of 1993

		Implementation: Indonesian Act Number 32 Year 2009 on Environmental Protection and Management
4.	LC/LP	-
No	**Soft Law**	**Ratification and Implementation**
1.	SDGs 2015	Implementation: Presidential Regulation Number 59 Year 2017 relating to Implementation of Achieving Sustainable Development Goals
2.	Honolulu Strategy	-
3.	Bangkok Declaration and ASEAN Framework of Action	Signing Implementation: Presidential Regulation Number 83 of 2018 concerning the Management of Marine Debris

(Source: Authors' Analysis)

a) UNCLOS 1982

The 1982 UNCLOS is recognized as the most comprehensive international convention governing the use of the ocean and is often referred to as the "constitution of the ocean (Merdekawati et.al, 2021)." However, while this convention provides broad provisions on marine environmental protection, it does not contain specific regulations on MPP. Instead, it incorporates the principle of *sic utere*, which obligates member states to "take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention" (United Nations Convention on the Law of the Sea, 1982c).

Although UNCLOS 1982 does not explicitly mention MPP, an implied reference can be found in Article 207. Paragraph 1 of this article states that states "shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from land-based sources, including rivers, estuaries, pipelines and outfall structures, taking into account internationally agreed rules, standards and recommended practices and procedures" (United Nations Convention on the Law of the Sea, 1982d; see also: Gold, Mika, Horowitz, Herzog, & Leitner, 2014). Land-based sources, as mentioned in this provision, can be interpreted to include various forms of waste, including plastic waste generated from land-based activities. Moreover, this article encourages states to establish effective waste management systems to minimize the entry of waste into the ocean. However, the reference to "internationally agreed rules, standards, and recommended practices and procedures" in this provision is overly broad, with no clear specification of which rules or practices should be followed. If state practices are to be considered, they cannot be uniformly applied, as countries differ in their capacities to manage waste and implement the stipulated rules, standards, and procedures. Consequently, this ambiguity has the potential to undermine the effectiveness of preventive measures (Widagdo & Anggoro, 2022).

This provision further refer to paragraph 5 of the same Article in explaining internationally agreed rules, standards and recommended practices and procedures. It envisages that “[l]aws, regulations, measures, rules, standards and recommended practices and procedures referred to in paragraphs 1, 2 and 4 shall include those designed to minimize, to the fullest extent possible, the release of toxic, harmful or noxious substances, especially those which are persistent, into the marine environment.” It is argued that while microplastic from plastic wastes can be considered as ‘toxic, harmful or noxious substances’, unfortunately, as a constitution of the ocean, none of UNCLOS 1982’s provisions offer specifics about the production, transportation, consumption, trade, or the-end of life treatment of plastics.

Indonesia is a party to UNCLOS 1982 and ratified the Convention through Indonesian Act Number 17 of 1985. Consequently, Indonesia should apply provisions of UNCLOS 1982. Such application was conducted either by harmonizing existing laws, revising or even enacting national laws. With regard to the protection and preservation of marine environment, while there is no specific national laws on MPP, however, Indonesia has promulgated various national laws relevant to waste control. This national law includes various statutory regulations related to the marine environment and waste management. After its ratification to UNCLOS 1982, Indonesia has made adjustment in several of its ocean related laws, especially on Indonesian waters and navigational regimes. Unfortunately, the national umbrella Act as the implementation of UNCLOS 1982 in general, has only taken place in 2014 with the enactment of Indonesian Act Number 32 of 2014 on Ocean Affairs (Indonesian Ocean Affairs Act). This Act basically confirms the provisions of UNCLOS 1982 relating to the protection and the preservation of marine environment. However, this Act does not adopt the maxim *sic utere*. This Act envisages the obligation of both government and local government in protecting and preserving marine environment (Indonesian Act Number 31 on Ocean Affairs, 2014), but somehow only within its national territory and jurisdiction. This Act is silent on the obligation of State to prevent the spreading of pollution beyond its national territory and jurisdiction, as envisages in Article 194 paragraph (2) of UNCLOS 1982. Article 52 of this Act only acknowledges that marine pollution can happen from within national territory and jurisdiction to the areas beyond national territory and jurisdiction with no further explanation on what if the pollution spread out to the neighbouring State's waters.

Furthermore, unlike UNCLOS 1982 which emphasizes the minimalization of 'toxic, harmful or noxious substances', the indicator of marine environment damage specifically refers to more specific standard, that is marine environmental quality standard. Unfortunately, this Act does not detail as how to determine the marine environmental quality standard and which

institution has the authority to set up and agree of specific marine environmental quality standard. Article 50 of the Act envisages that "the Government makes efforts to protect marine environment through marine conservation; controlling marine pollution; setting up control measure of marine disaster and prevention as well as controlling pollution, damage and disaster." Explanatory clause of Article 50 further explains that marine pollution control includes prevention, mitigation and restoration. Yet, there is no detail mechanism of such marine pollution control. Despite of its weaknesses, this Act adopts polluter pays principles and precautionary principle as envisages in Article 52. While there is no further explanation on the mechanism to implement the polluter pays principles, i.e. to whom the polluter pays for the damage he/she caused, at least the adoption of these principles shows that Indonesia is very keen to provide sufficient national laws and measures in its effort to combat MPP.

Since most of marine pollution comes from land-based activities, national law relating to the protection and preservation of environment, that is Indonesian Act Number 32 of 2009 on the protection and preservation of environment, is relevant to this discussion. This Act (Law Number 32 of 2009 on Environmental Protection and Management has been replaced by Law No. 6 of 2023 on the Enactment of Government Regulation in Lieu of Law Number 2 of 2022 on Job Creation into Law. Try to relate the changes in regulations and their significance in this research), although not specifically regulates plastic waste in the sea, but this law regulates the prevention and control of pollution in general. Article 13 paragraph (3) of this law regulates that pollution prevention is carried out by the central government and regional governments, as well as by those responsible for businesses and/or activities in accordance with their respective authorities, roles and responsibilities. Article 60 of this Act clearly prohibits individuals and companies from dumping hazardous waste into the environment, including the marine environment without permission. Although this hazardous waste can implicitly reffers to liquid waste, there is possibility that such liquid wastes contain microplastic. Thus, this Act

provides sanction to unauthorized microplastic dumping. Such waste can be classified as harmful substance as provided within the Basel Convention. Article 63 paragraph (1) further appoints the central government to establish and implement environmental protection policies, and of course including the marine environment. In relation to the marine environment, this authority can be used as an effort to prevent marine pollution, for example through Environmental Impact Analyses instruments (Garcia, Fang, & Lin, 2019). This instrument can help the government, especially regional governments when dealing with illegal dumping carried out at sea, especially in coastal areas and rivers.

The implementing regulation for this Act is Government Regulation Number 19 of 1999 on the Control of Marine Pollution and/or Destruction. Although this regulation does not explicitly mention MPP or microplastics, it prohibits both land-based and ocean-based activities that cause pollution in marine and coastal areas. It incorporates the *polluter-pays* principle, which obligates polluters to restore environmental damage to its original state (Maruf, 2019). However, the regulation lacks specific enforcement mechanisms and monitoring provisions, making it challenging to ensure compliance and hold violators accountable.

Additionally, this regulation designates relevant institutions responsible for environmental control, with the Ministry of Environment serving as the primary authority. However, it does not provide specific provisions regarding the mechanisms for monitoring and controlling marine pollution, nor does it outline enforcement measures.

b) International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)

Another international legal framework relating to marine pollution is the 1973 International Convention for the Prevention of Pollution from Ships as modified by the Protocol of 1978 (MARPOL 73/78). This Convention provides provisions that serves as the basis for the prevention, reduction and control of vessel-source pollution and also it consists of

several annexes to regulates specifically on the type of pollution enter into the ocean. In general, MARPOL 73/78 encourages coastal States to provide facilities for the management of 'harmful substances' such as waste oil, garbage and noxious liquid substances (Karim, 2010). Relevant annex can be found in Annex V which defines implicitly plastic wastes as "including, but not limited to synthetic ropes, synthetic fishing nets, plastic garbage and incinerator ashes from plastic products which may contain toxic or heavy metal residues" (International Convention for the Prevention of Pollution by Ships (MARPOL 73/78), 1997; Clark et al, 2023). This Convention details how to treat plastic wastes found mixing with other solid wastes, that is "as if it is all plastic and subject to very stringent procedures for the handling and discharge" (Oral, 2021). Despite this legal framework, plastic debris continues to significantly impact marine ecosystems, with estimates indicating that millions of metric tons of plastic still enter the oceans annually (Issifu & Sumaila, 2020). The inadequacies in compliance and enforcement mechanisms play a critical role in this ongoing environmental crisis, which necessitates stricter adherence to MARPOL's stipulations (Vince & Hardesty, 2016).

Indonesia ratified MARPOL 73/78 through Presidential Decision Number 46 of 1986 on the ratification of MARPOL 73/ 78. This State further ratified Annex III, IV, V and VI of MARPOL 73/78 through Presidential Regulation Number 29 of 2012 relating to the ratification of Annex III, IV, V and VI of MARPOL 73/78. In implementing MARPOL 73/78, Indonesia enacted Act Number 17 of 2008 on Navigation, which has then undergone three times revisions by the latest Act Number 66 of 2024 relating to the Third Amendment of Act Number Act Number 17 of 2008 on Navigation. This Act provides a quite detail provisions on the protection and preservation of marine environment, especially from ships operation. However, this Act is silent on MPP. Unlike MARPOL 73/78, this Act does not list types of marine pollutant. This Act interrelate between protection of marine environment with seaworthiness of ships through

the requirement of Safety Management Certificate (SMC) from ships; and requires the publication Document of Compliance (DOC) from relevant ministry stating that the shipping company comply with necessary measures in preventing marine pollution. However, in practice, such documents only relate with the safety of ships. This Indonesian Navigational Act, unfortunately is silent on the precautionary principle in protecting and preserving marine environment. Furthermore, in overall this Act only provides the prevention of marine pollution over the waters within national jurisdiction and silent on the waters beyond national jurisdiction. In addition to this, it is unclear whether this Act requires monitoring to be conducted also to foreign ships. If so, how the monitoring will be conducted? What about foreign ships who only traversing Indonesian waters without proceeding to certain ports?

The implementing regulation of Navigational Act is Government Regulation Number 21 of 2010 relating to the Protection of Maritime Environment (Government Regulation No 21year 2010 about Protection Marine Environment, 2010). This regulation refers to the protection of maritime environment from shipping activities and any other impact of ships' operation as well as port activities (Government Regulation No 21year 2010 about Protection Marine Environment, 2010). Meanwhile, the types of pollutants or contaminants that are within the scope of this government regulation include oil spills originating from ship operations as well as toxic liquid materials that can cause damage to the maritime environment. Article 3 paragraph (2) of this government regulation details the various pollutants that may pollute the sea. According to Article 3 paragraph (2), environmental pollution originating from ships includes: a. oil; b. toxic liquid materials; c. cargo of hazardous materials in packaged form; d dirt; e. rubbish; f. virgin; g. ballast water; and/or h. goods and materials dangerous to the environment on board. Even though these provisions do not explicitly mention plastic waste, plastic can be categorized as an item or material that is dangerous to the environment on ships.

However, the pattern for dealing with emergencies related to pollution is only related to oil spills.

This Government Regulation is also in line with Minister of Transportation Regulation Number 29 of 2014 concerning Prevention of Marine Environmental Pollution, which also requires all ships, both Indonesian and foreign flagged, to provide a Garbage Record Book and equip ships with waste disposal procedures as outlined in the Garbage Management Plan.
In its implementation, this government regulation places an obligation on ship captains to make efforts to overcome pollution caused by the operation of their ships (Government Regulation No 21year 2010 about Protection Marine Environment, 2010). Meanwhile, for dealing with pollution from port activities, this government regulation requires Port Authorities, Port Management Units, Port Business Entities and Special Terminal Managers to be responsible for dealing with pollution originating from their activities (Government Regulation No 21year 2010 about Protection Marine Environment, 2010). This mechanism is carried out through reporting to the harbormaster. Unfortunately, it is not explained further what the monitoring, evaluation and control mechanisms are in terms of the effectiveness of government regulations.

c) Convention on Transboundary Movements of Hazardous Wastes and Their Disposal 1989 (Basel Convention)

The Convention on Transboundary Movements of Hazardous Wastes and Their Disposal, commonly known as the Basel Convention, plays a crucial role in addressing plastic pollution by regulating the transboundary movement of hazardous waste, including certain types of plastic waste classified as hazardous. Recent amendments to the convention have broadened its scope to encompass plastic waste that is not otherwise specifically regulated, reflecting a growing acknowledgment of the significant environmental and health risks posed by such waste, especially in developing countries that may lack advanced waste management systems (Khan, 2020). The illegal transportation of plastic waste has become a considerable

challenge, as developed nations frequently export their plastic waste to countries with less stringent regulatory frameworks, which worsens local pollution problems and affects marine environments (Vince & Hardesty, 2018).

Unlike the 1982 UNCLOS, which emphasizes proactive state actions to prevent marine pollution, the Basel Convention primarily focuses on passive measures by prohibiting the entry of waste into areas under national jurisdiction. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989) aims to safeguard human health and the environment from the harmful effects of hazardous waste. Its provisions center on reducing hazardous waste production, promoting environmentally sound waste management, limiting the transboundary movement of hazardous waste, and establishing a regulatory system for the permitted transfer of such waste.

Integrating the principles of the Basel Convention into broader plastic regulation frameworks may enhance compliance and accountability for transboundary waste movements. The increasing focus on Extended Producer Responsibility (EPR) is seen as a potential strategy to hold manufacturers accountable for the entire lifecycle of their plastic products, thereby helping to decrease overall plastic waste generation (Khan, 2020). Moreover, international cooperation underpinned by the Basel Convention can lead to improved waste management practices, potentially mitigating the extensive influx of plastic pollution, particularly in developing regions that are burdened by significant imports of hazardous waste from abroad (Navarre et al., 2023; Vince & Hardesty, 2018).

However, plastic waste was initially excluded from the scope of the Basel Convention and was classified as a general commodity under international trade regulations. This exclusion has been criticized as a significant weakness of the Convention, as it potentially allowed states to evade their environmental responsibilities. Moreover, it created loopholes for states to

illegally mix plastic waste with other types of waste in cargo shipments (Barsalou & Picard, 2018).

This issue was later addressed through amendments to Annexes II, VIII, and IX of the Convention, which reclassified plastic waste as a hazardous pollutant (Ahmad Khan, 2020). Following this amendment, plastic waste—previously considered low-risk or even non-hazardous—was redefined as a pollutant requiring Prior Informed Consent (PIC) for transboundary movement. Consequently, both exporting and importing countries are now prohibited from engaging in plastic waste trade unless explicitly authorized by the receiving country (Johnson et al., 2021).

Indonesia ratified the Basel Convention through Presidential Decree 61 of 1993 on the Ratification of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989). Additionally, Indonesia ratified the amendments to the Convention through Presidential Regulation Number 47 of 2005. However, on January 1, 2025, the Convention underwent further amendments requiring prior written consent from importing and transiting countries for international shipments of electrical and electronic waste and scrap intended for recovery (including recycling) or disposal.

While microplastics can be classified as hazardous waste, the Convention does not specifically address MPP, as most marine plastic pollution enters the ocean unintentionally rather than being deliberately transferred. At the national level, no further regulatory developments have been introduced regarding the latest amendment to the Convention.

Meanwhile**,** Law Number 32 of 2009 on Environmental Protection and Management amendment to Law No. 6 of 2023 on the Enactment of Government Regulation in Lieu of Law Number 2 of 2022 on Job Creation into Law. does not explicitly regulate plastic waste in the marine environment. However, it provides general provisions on pollution prevention and control. Article 13, paragraph (3) of this law stipulates that pollution prevention efforts are to

be carried out by the central and regional governments, as well as by business entities and those responsible for activities, in accordance with their respective authorities, roles, and responsibilities.

Article 60 of this law clearly prohibits individuals and companies from disposing of hazardous waste into the environment, including the marine environment without permission. Although it can be implicitly said that the regulation refers to liquid waste in the form of waste or other dangerous liquids, the liquid waste in question may also contain microplastics. So this law can provide sanctions for the disposal of microplastics without permission which is also useful for preventing plastic waste pollution in the sea. Thus, if industrial waste/waste contains microplastics, it must be categorized as 'harmful substance' as regulated in the Basel Convention, and such waste must be managed carefully and not damage the environment, especially the marine environment. Article 63 paragraph (1) further appoints the central government to establish and implement environmental protection policies, and of course including the marine environment. In relation to the marine environment, this authority can be used as an effort to prevent marine pollution, for example through an AMDAL instrument (Garcia, Fang, & Lin, 2019). This instrument can help the government, especially regional governments when dealing with illegal dumping carried out at sea, especially in coastal areas and rivers.

Although Government Regulation Number 19 of 1999 concerning Control of Marine Pollution and/or Destruction is an implementing regulation of Law Number 32 of 2009 on Environmental Protection and Management amendment to Law No. 6 of 2023 on the Enactment of Government Regulation in Lieu of Law Number 2 of 2022 on Job Creation into Law. Even though there are no provisions in this government regulation that specifically mention plastic waste, microplastics may be found in liquid waste that enters and pollutes the sea. Responsibility for controlling pollution in the sea lies with each individual and person in

charge of the business/activity. This government regulation prohibits activities that cause marine and coastal pollution which will reduce the quality of sea water itself, thereby endangering both humans and other marine biota.

Law enforcement provisions and sanctions are given based on the polluter-pay principle or whoever pollutes the sea is the one who is responsible for paying for the damage in order to return it to its original state (Maruf, 2019). This Government Regulation further only explains that the agency in question is the agency responsible for controlling environmental impacts. Meanwhile, the Minister in question is the Minister tasked with managing the environment. Unfortunately, this Government Regulation does not regulate control and supervision mechanisms or law enforcement regarding pollution in the sea.

d) Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter and its 1996 Protocol (LC/LP)

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972) and its 1996 Protocol (LC/LP) play a crucial role in regulating marine plastic pollution, specifically controlling the dumping of various types of waste, including plastics, into the oceans. The primary objective of this convention is to protect the marine environment from harmful waste disposal that can adversely affect human health and marine ecosystems (Râpă et al., 2024). Recent discussions indicate that there is a need to enhance compliance mechanisms and monitoring procedures for the regulations established by the LC/LP, as illegal dumping practices pose significant ongoing challenges (Ferraro & Failler, 2020). The development of agreements under the LC/LP underscores the importance of international cooperation to safeguard marine environments against the growing threat of plastic pollution (Zhang et al., 2020). Additionally, interdisciplinary approaches that encompass scientific assessments, stakeholder engagement, and improved reporting requirements are vital for effectively addressing the complexities of marine plastic pollution

(Ferraro & Failler, 2020). The current discourse surrounding the impacts and management of plastic waste highlights the importance of stringent enforcement of conventions like the LC/LP and the implementation of proactive strategies to reduce plastic waste at its source (Râpă et al., 2024).

Although there have been improvements from the LC to the LC/LP regarding the precautionary principle, Oral states that the LC/LP does not regulate standard procedures for extracting, identifying, and measuring microplastics contained in sludge waste dumped into the sea. As a result, it is not possible to determine whether microplastics are present in the waste (Oral, 2021). The improvements made to the LC in the LC/LP also include the establishment of procedures to enforce laws against ships and aircraft that dispose of hazardous materials at sea. This allows the LC/LP parties to more easily enforce the law. Unfortunately, Indonesia has not ratified this Convention.

e) Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) provide a vital framework for addressing marine plastic pollution, particularly through SDG 14, which focuses on life below water. The interconnection between effective marine plastic regulation and these goals is apparent in several dimensions, including ecosystem conservation and pollution mitigation. Achieving targets such as reducing all types of marine pollution and protecting marine and coastal ecosystems is crucial for sustainable ocean health (Issifu & Sumaila, 2020).

Regulatory frameworks such as the Basel Convention can enhance the effectiveness of SDG 14 by ensuring that hazardous waste, including certain plastics, is managed responsibly (Raubenheimer & McIlgorm, 2018). Moreover, integrating area-based management tools and fostering international cooperation can support marine conservation efforts, making significant contributions to the goals outlined in SDG 14 (Reimer et al., 2020; Bank et al., 2021).

Furthermore, the role of citizen science in monitoring marine plastic pollution can mobilize community engagement, thereby reinforcing the collective action necessary to meet SDG targets (Gacutan et al., 2023). Research indicating that plastic pollution poses significant threats to marine biodiversity emphasizes the necessity of robust regulations aligned with the SDGs to ensure sustainable management of oceanic resources (Singh et al., 2019; Rashed et al., 2023).

f) Honolulu Strategy

The Honolulu Strategy serves as a comprehensive framework aimed at addressing global marine debris issues, closely linking to marine plastic regulations. This strategy emerged from the Fifth International Marine Debris Conference held in March 2011 and emphasizes the need for integrated approaches to manage both land- and sea-based sources of marine debris, particularly plastic waste (Hong et al., 2013). The strategy outlines objectives to reduce the quantity of marine debris and mitigate its impacts, which directly contribute to targets within Sustainable Development Goal 14, focused on life below water (Irianto et al., 2022).

Additionally, the Honolulu Strategy encourages international cooperation and multi-stakeholder engagement, fostering guidelines that enhance regulatory frameworks at national and regional levels (Abalansa et al., 2020). Countries are encouraged to align their policies with the strategy, integrating mechanisms like Extended Producer Responsibility (EPR) to hold manufacturers accountable and reduce plastic waste generation at the source (Winterstetter et al., 2021). Furthermore, the strategy highlights the importance of education and outreach in raising public awareness about marine plastic pollution, which is critical for compliance and effective implementation of marine regulations (Irianto et al., 2022). Since this Honolulu Strategy remains as a mere document, Indonesia does not proceed further with Honolulu Strategy.

g) Bangkok Framework on Combating Marine Debris in ASEAN Region (Bangkok Framework) and ASEAN Framework of Action

Another softlaw in the form of declaration was adopted in 2019, known as the Bangkok Declaration on Combating Marine Debris in ASEAN Region (Bangkok Declaration). The Bangkok Framework on Combating Marine Debris in the ASEAN Region and the ASEAN Framework of Action represent collaborative efforts to tackle the pervasive issue of marine plastic pollution. These frameworks prioritize action-oriented strategies to minimize both land-based and marine-based debris, aligning with broader international initiatives like the Honolulu Strategy and the Sustainable Development Goals (SDGs) (Rochman et al., 2016). The Bangkok Framework emphasizes regional cooperation among ASEAN member states to implement effective waste management practices and improve public awareness regarding the impacts of marine debris on ecosystems and human health (Teuten et al., 2007).

Both frameworks call for the establishment of comprehensive policies aimed at reducing plastic pollution through measures such as promoting the circular economy and developing innovative waste reduction technologies (Kusumawati et al., 2020). The ASEAN Framework of Action further highlights the importance of stakeholder engagement, including local communities, businesses, and governments, to ensure a multifaceted approach toward effective marine plastic regulation (Brignac et al., 2019).

Moreover, the frameworks advocate for monitoring and data-sharing regarding marine debris, which is essential for assessing the effectiveness of implemented strategies and informing future policy adjustments (Roman et al., 2016). By emphasizing regional collaboration, capacity building, and scientific research, the Bangkok Framework and ASEAN Framework of Action represent significant steps toward sustainable management of marine plastic pollution in Southeast Asia (Kusumawati et al., 2020).

Indonesia further implements these instruments through Presidential Regulation Number 83 of 2018 concerning the Management of Marine Debris (Presidential Regulation 83/ 2018). Unfortunately, a declaration of political statements and an understanding of the goals of countries in ASEAN envisages in Bangkok Declaration the ASEAN Framework of Action are not technically written in Presidential Regulation 83/ 2018. However, this Presidential Regulation provides plan of action on marine plastic debris (2017-2025) include indicators of the success of strategies for handling waste at sea, such as socializing the management of plastic waste on coasts and seas, providing incentives to plastic waste managers on the coast and sea, as well as encouragement by the government for upstream industry players to produce biodegradable plastic, and various other programs. On this plan of action, the coordinating minister for Maritime Affairs and Investment (CMMAI), Luhut Pandjaitan argued that out of 70% targeted marine plastic debris reduction, in 2022 the reduction has reached 35.36% (Siong et al., 2023).

From the above analyses, it is argued that in fact none of those international legal instruments provides specifically on MPP, except LC/ LP. It is argued that from all international legal frameworks discussed above, only LC/ LP adopt the precautionary principle. However, unfortunately, Indonesia does not ratify LC/ LP. In national level, national laws also operate very sectoral and not all international legal frameworks are covered in national laws. Thus, it is crucial for Indonesia to integrate and harmonize national laws relating to the protection and preservation of marine environment, especially relating to MPP. The following table summarizes international legal framework relating to marine pollution and the types of wastes. Followed by list of Indonesia's laws comparison to relevant international legal frameworks.

Table 2: International Legal Framework Addressing MPP

No		UNCLOS 1982	MARPOL 73/78	Basel Convention	LC/LP	SDGs 2015 (Soft Law)	Honolulu Strategy 2011 (Soft Law)	Bangkok Declaration & ASEAN Framework 2019 (Soft Law)
1	**Type of Wastes**	General (non-specific MPP)	Annex 5 including MPP	Annex II, VIII, IX specific MPP	MPP	General (non-specific MPP)	General (non-specific MPP)	General (non-specific MPP)
2	**Law Enforcement**	Prevent, Reduce, Control	Inspection Monitoring, Sanction	Prohibition of dumping wastes in its marine areas	Directly against ships and aircraft	Prevention, Reduction, Recycling, Re-use	Research, Assessment, Joint Monitoring	Through the National Action Plan
3	**Pre-cautionary Preventionary Principles**	X	X	X	V	X	X	X

(Source: Authors' Analysis)

No		Indonesian Act 17/ 2008	Indonesian Act 32/ 2009*	Indonesian Act 32/ 2014	Government Regulation 19/1999	Government Regulation 21/ 2010	Presidential Regulation 83/ 2018	Government Regulation 31/ 2021	Government Regulation 13/ 2022
1.	**UNCLOS 1982**	V	X	V	X	V	V	V	V
2.	**MARPOL 73/78**	X	X	V	X	X	V	X	X
3.	**Basel Convention**	X	V	X	X	X	X	X	X
4.	**SDGs**	X	X	X	V	X	V	X	X
5.	**Honolulu Strategy**	X	X	X	X	X	X	X	X
6.	**Bangkok Declaration & ASEAN FOA**	X	X	X	X	X	V	X	X

Table 3: Comparison between national laws and international laws

Note: V: adopting; X: not adopting; (Source: Authors' Analysis)

* Law Number 32 of 2009 on Environmental Protection and Management amendment to Law No. 6 of 2023 on the Enactment of Government Regulation in Lieu of Law Number 2 of 2022 on Job Creation into Law

3. Other Measures

Although Indonesia has exhausted list of national laws both as ratifying Act or implementing laws relating to the effort in combatting MPP, it does not mean that the sea is free from plastic waste. It is not easy to control the flow of the ocean and determine the origin of wastes in Indonesian waters. States' obligations in preventing, reducing and dealing with plastic waste in the sea require the involvement of all levels of government at the international, regional, national and local levels (or in this case regional governments).

There are several measures that has been implemented in Indonesia. These include managing abandoned, lost or otherwise discarded fishing and aquaculture gear (ALDFG) and end-of-life fishing gear (EOLFG); river cleaning programs and single-use plastics (SUP). The most common measure is SUP policy. Even though Indonesia does not yet have regulations on the SUP policy nationally, this policy has also been adopted sporadically by regional governments. According to the Ministry of Environment and Forestry (MEF), a total of 58 districts and cities, along with two provinces, have implemented local regulations restricting or banning single-use plastics (Dari Laut Redaksi, 2021). However, not all regions possess the necessary capacity to establish similar regulations. Moreover, the success of such policies depends on consistent enforcement and well-defined mechanisms for supervision and monitoring to ensure effective implementation within the legal framework.

The first regional government to implement a ban on plastic use was Bali, through Bali Governor Regulation Number 97 of 2018 on Restrictions on the Generation of Single-Use Plastic Waste (Bali Governor Regulation 97/2018). This regulation defines single-use plastics (SUP) to include plastic bags, polystyrene (Styrofoam), and plastic straws. It applies to manufacturers, consumers, and local governments, with a specific prohibition on the production of SUP by manufacturers. Additionally, the regulation mandates regional governments to develop action plans, which include setting baseline data for SUP and

establishing annual reduction targets. It also outlines financing mechanisms, incentive programs, and collaborative efforts with various stakeholders, including religious institutions. Law enforcement measures are explicitly addressed, incorporating the role of customary law enforcers, and the regulation has proven effective in reducing marine plastic pollution. Since the majority of marine plastic pollution originates from land-based waste, managing land-based plastic waste is crucial in addressing the issue. Following Bali's initiative, other regional governments quickly adopted similar regulations.

Despite the importance of regional regulations in reducing plastic waste, their implementation remains inconsistent across different areas due to varying capacities among local governments. Furthermore, the absence of a national-level policy prevents the widespread application of such regulations across all 38 provinces in Indonesia. To enhance effectiveness, it is essential to establish a unified national regulation that incorporates both a user-pays plastic bag policy and a single-use plastics policy. This regulation should be standardized across all provinces and accompanied by strict enforcement, clear monitoring mechanisms, and appropriate sanctions. Additionally, local governments should be required to establish baseline data on plastic waste in their jurisdictions and set targeted reduction goals within a specified timeframe, supported by strategies and programs tailored to regional conditions.

4. Law Enforcement: Institutional Issues

Institutional issues relating to the law enforcement at sea have added complexity in tackling MPP in Indonesia. Puspitawati argued that there are more than 10 institutions having the authority in law enforcement at sea (Puspitawati, Hadiyantina, Susanto, & Apriyanti, 2020). However, Article 61 of Indonesian Ocean Act gives the sole authority to Indonesian Maritime Security Agency (IMSA) without eliminating similar authority of other institutions. As stated in Article 61 as follows: "IMSA has the task of carrying out security and safety patrols in Indonesian waters and jurisdiction" (Law of the Republic of Indonesia No. 32 of 2014 on

Marine Affairs., 2014). Article 61 further implemented by Government Regulation Number 13 of 2022 concerning the Implementation of Security, Safety and Law Enforcement in Indonesian Water Areas and Indonesian Jurisdiction, which reaffirms the authority of IMSA relating to the law enforcement at sea (Government Regulation N0 13 of 2022 Concerning the Implementation of Security, Safety and Law Enforcement in Indonesian Water Areas and Indonesian Jurisdiction, 2022).

While Indonesian Ocean Act gives the State the obligation to protect and preserve marine environment, it is unclear whether such obligation include law enforcement. Nevertheless, it is argued that marine pollution can be considered as one of threat to maritime security. Thus, the task of law enforcement at sea would include the law enforcement on marine pollution. Unfortunately, there is no clear mechanism on the law enforcement with regard to protecting and preserving marine environment. Furthermore, Indonesian Ocean Act seems to distinguish between law enforcement at sea relating to maritime security with the obligation to protect and preserve marine environment. Article 55 of the Act further reads "[t]he Government and the Regional Government are required to implement a system for the prevention and control of pollution and environmental damage to the ocean" (Law of the Republic of Indonesia No. 32 of 2014 on Marine Affairs., 2014b). This provision leads to the question whether the government refers to IMSA or any other specific institutions? In addition to this, which units of regional government having this authority since regional government do not have clear authority relating to the law enforcement at sea.

The role of law enforcement officers is crucial to reduce or even eliminate marine pollution due to plastic waste. Law enforcers themselves should enforce these regulations more, not only for polluters who carry out activities at sea but also for people who carry out acts of pollution either directly at sea or deliberately throwing rubbish from land into the sea. There needs to be cooperation from various agencies to prevent the entry of plastic waste into

the ocean. This collaboration will not be easy to do, but that doesn't mean it can't be done at all. Therefore, it is necessary to have a Law Enforcement Institutional Model for Marine Pollution Due to Plastic Waste in Indonesia. It is submitted that with a good institutional model and clear cooperation it is not impossible to reduce the level of plastic pollution in Indonesian seas.

In addition to this, Indonesian Ocean Act also envisages clearly the role of regional governments by giving responsibility to the central government and regional governments to implement a system for mitigating pollution and damage to the marine environment. As stated in Article 55 of the Act as follows: "the government and regional governments are obliged to implement a system for preventing and controlling pollution and damage to the marine environment" (Indonesia Law of the Sea No.32/2014, 2014). Furthermore, according to Indonesian Act Number 23 of 2014 concerning Regional Government Article 27 paragraph (3), the Provincial authority to manage natural resources in the sea is a maximum of 12 (twelve) nautical miles measured from the coastline towards the open sea and/or towards archipelagic waters. Thus, apart from national legal regulations at the level of legislation up to ministerial decisions, the existence of regional regulations regarding the prevention, reduction and management of marine waste is also important. Presidential Regulation No 83 of 2018 provides National Plan of Action (NPOA) on the protection and prevention of marine environment. This NPA also includes regional governments as related agencies, but the role of regional governments is only as implementers of the NPOA. It is hoped that the role of regional governments can be more towards providing regulations to support the central government's efforts in preventing, reducing and dealing with marine waste, especially plastic waste.

Effective handling of marine waste by local governments largely depends on their understanding of the geographical and social conditions in the areas where the waste is generated. Since there is no one-size-fits-all approach, every region cannot be forced to adopt

the same strategy. Therefore, local authorities have a significant role to play in preventing, reducing, and managing marine waste caused by plastic. In Indonesia, some regional governments have introduced policies such as the user-pays plastic bag policy and the single-use plastics tire policy to regulate the use of plastic and encourage participation in waste reduction efforts. Effective handling of marine waste by local governments largely depends on their understanding of the geographical and social conditions in the areas where the waste is generated. Since there is no one-size-fits-all approach, every region cannot be forced to adopt the same strategy. Therefore, local authorities have a significant role to play in preventing, reducing, and managing marine waste caused by plastic.

Thus, the law enforcement model should also put regional government in cooperation with IMSA as law enforcement institution in national level. Such cooperation can serve as a model for effectively managing plastic waste in the seas surrounding Indonesia. This approach is more impactful than relying solely on the central government, in this case IMSA alone. With thousands of islands and vast stretches of sea, it would be challenging to tackle this issue without the support of local government.

Apart from that, the role of regional government as a government that is close to the community will also help government programs to run better. For example, many people have started to organize activities to clean rivers and beaches in Indonesia. With positive community activities, regional and central governments can also play a role in facilitating the community or supporting all community activities. On the other hand, local governments can also make breakthroughs by initiating activities to clean beaches and rivers in their area so that waste will not be carried far into the ocean. Collaboration between all parties will also make it easier to create a sea that is cleaner from plastic waste. Regional governments that do not have marine areas can also clean up rivers in their area or create policies to reduce plastic waste. This good institutional collaboration will also increase the awareness of the people

around the area and can even increase the awareness of the entire Indonesian population in the future.

C. Conclusion

This study aimed to analyze Indonesia's regulatory and institutional approaches in tackling marine plastic pollution (MPP) and assess their effectiveness in addressing this environmental crisis. The findings indicate that while Indonesia has ratified several international legal frameworks, their domestic implementation remains fragmented due to overlapping institutional authorities, weak enforcement mechanisms, and a lack of national legislation specifically addressing MPP. The regulatory framework primarily operates sectorally, with no single, integrated policy governing plastic pollution management. Furthermore, although local initiatives such as single-use plastics (SUP) bans have shown some success, the absence of a nationwide standardized policy limits their impact.

The variations in regulatory approaches, from international conventions to regional and national policies, reveal a critical gap between legal commitments and enforcement capacity. Despite Indonesia's adoption of key principles such as the *polluter pays* and precautionary principles, inconsistencies in law enforcement and monitoring mechanisms weaken their practical application.

This study acknowledges the limitations of its scope, as it primarily focuses on legal and policy analyses without empirical field assessments of enforcement effectiveness. Future research should explore data-driven evaluations of policy outcomes and the role of multi-stakeholder collaborations in strengthening Indonesia's response to marine plastic pollution.

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