



Governing Drift: Legal Challenges in Indonesia's Cross-Border Marine Waste Management in Malacca Straits

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Abstract. Indonesia is increasingly confronted with transboundary marine debris, with impacts most visible in maritime border areas such as the Malacca Strait. Although Indonesia has enacted an extensive body of domestic environmental legislation and is bound by international duties, most prominently under the United Nations Convention on the Law of the Sea (UNCLOS), the practical effectiveness of its marine waste governance remains unclear. This article analyzes Indonesia's fulfillment of its responsibilities to safeguard and conserve the marine environment as stipulated in UNCLOS Articles 192–198, while also highlighting the legal and institutional barriers that hinder enforcement in border areas. Utilizing normative legal research, the study examines primary sources such as UNCLOS provisions, Indonesian environmental regulations, and pertinent regional agreements, while triangulating these materials with secondary scholarship and case-based examples from significant marine zones. This article will examine how efficiently Indonesia has fulfilled its responsibility to safeguard the global marine ecosystem in managing transboundary waste. What problems still make it hard to carry out these duties? The study demonstrates that Indonesia's obligations conform to established norms. In practice, though, they don't operate as well because institutional mandates are broken, there isn't enough enforcement capacity at the subnational level, and there aren't any enforceable regional institutions that deal with marine debris. Indonesia has not fully utilized the available international legal mechanisms, such as UNCLOS dispute settlement or state responsibility, to address transboundary harm. The article argues that significant improvement requires institutional consolidation and coordination, the creation of regional legal frameworks with clearer compliance expectations, and a more explicit integration of marine environmental protection into Indonesia's foreign relations and maritime diplomacy.

Keywords: Transboundary Marine Pollution; Marine Waste Management; Maritime Borders; Cross-Border Waste

1 Introduction

Marine environmental degradation driven by pollution has become a central concern for both international environmental governance and the law of the sea. Among its many manifestations, transboundary marine waste is particularly difficult to regulate; it travels across jurisdictional lines, originates from multiple sources, and is shaped by uneven national capacities and shifting patterns of maritime activity. Indonesia sits at the centre of this problem. As the world's largest archipelagic state, comprising more than 17,500 islands, Indonesia occupies a geographically strategic yet ecologically vulnerable position [1]. It is bordered by numerous coastal neighbours and lies along some of the world's busiest shipping corridors, including the Strait of Malacca, the Celebes Sea, and the Timor Sea. These waters function simultaneously as economic lifelines and sensitive marine ecosystems, but they are increasingly burdened by waste streams—both land-based and vessel-based—that often originate outside Indonesia's jurisdiction [2]. The accumulation of plastic debris, oil residues, and hazardous substances, compounded by limited monitoring infrastructure, uneven enforcement, and thin regional cooperation, illustrates a transboundary governance challenge that tests the capacity of national regulation and the effectiveness of international legal obligations.

Indonesia's legal response is anchored in a layered framework, domestic environmental and maritime legislation on the one hand, and multilateral treaty commitments on the other. The most significant of these commitments is the United Nations Convention on the Law of the Sea (UNCLOS), ratified by Indonesia through Law No. 17 of 1985 [3]. UNCLOS continues to structure Indonesia's marine legal order, including its duties to protect and preserve the marine environment and to prevent, reduce, and control pollution (Articles 192–198). Yet the practical implications of these provisions remain insufficiently examined in the Indonesian context—particularly in terms of how they translate into enforceable mandates, how they are institutionalized across agencies and levels of government, and how far they align with existing domestic statutes and policies. Indonesia has adopted important legislative instruments, including Law No. 32 of 2009 on Environmental Protection and Management and Law No. 32 of 2014 on Marine Affairs, but implementation and enforcement remain uneven and, in border regions, frequently fragmented [4].

Against this background, this article undertakes a doctrinal and critical legal analysis of Indonesia's obligations under UNCLOS, with a focus on Articles 192–198, and assesses the extent to which those obligations have been operationalized in national law and practice. It also examines the pathways through which these duties might be made more consequential, including the dispute settlement mechanisms under Part XV of UNCLOS and the broader framework of state responsibility under general international law. To ground the analysis, the article draws on illustrations from Indonesia's maritime

border zones—particularly the Strait of Malacca—as sites where normative commitments encounter recurrent institutional overlaps, gaps in capacity, and practical constraints on surveillance and compliance. These border spaces, where multiple jurisdictions and high-intensity maritime traffic intersect, provide a useful lens for evaluating whether Indonesia’s legal architecture is capable of addressing transboundary environmental harm in a consistent and legally defensible manner.

The article’s contribution is twofold. First, it offers a structured legal account of the disconnect between Indonesia’s treaty-based commitments and the realities of enforcement in cross-border marine pollution contexts. Second, it advances an enforcement-oriented perspective by identifying domestic and international mechanisms through which accountability for transboundary marine waste might be strengthened—whether through institutional coordination and clearer mandates within Indonesia’s governance system or through more strategic engagement with regional and international legal processes.

While scholarship on Indonesia’s domestic waste governance and broader marine pollution challenges is substantial, relatively few studies develop a detailed doctrinal analysis of UNCLOS’s environmental provisions from the standpoint of an archipelagic state grappling with transboundary waste, and fewer still engage directly with the justiciability and enforcement potential of Part XV procedures or transboundary environmental liability principles [5],[6]. By bringing treaty interpretation into conversation with domestic implementation constraints, this article aims to fill that gap and to clarify what legal tools are available—and why they have, so far, been underutilized—in addressing one of Southeast Asia’s most persistent marine environmental challenges.

2 Problem Statement

Notwithstanding Indonesia’s far-reaching commitments under UNCLOS and its relatively dense body of domestic environmental and maritime legislation, transboundary marine waste continues to be a persistent—and often insufficiently governed—problem in the country’s maritime border areas. The steady movement of debris across borders in zones such as the Strait of Malacca and the Singapore–Riau corridor highlights a recurring disconnect between Indonesia’s formal legal duties and the realities of monitoring, enforcement, and inter-state coordination on the ground [7]. This article assesses the extent to which Indonesia has translated its international obligations under UNCLOS—particularly Articles 192–198—into concrete regulatory and institutional practice. It further maps the principal constraints that impede effective prevention, control, and accountability for cross-border marine waste, including fragmented governance arrangements and limited subnational enforcement capacity.

3 Research Method

This article employs normative legal research, focusing on the analysis of primary legal materials—statutes, treaties, regulations, and judicial decisions—alongside authoritative commentaries and peer-reviewed literature. The primary legal texts analyzed include UNCLOS, MARPOL 73/78, and Indonesia's environmental and maritime laws (notably Law No. 32 of 2009, Law No. 32 of 2014, and Law No. 17 of 2008 on Shipping). Secondary sources include journal articles, expert legal commentaries, and case studies of legal implementation in Malacca Strait.

4 Findings

4.1 Legal Framework

Indonesia's framework for marine environmental protection is shaped by its dual position, it is both a sovereign archipelagic state with extensive maritime jurisdiction and a treaty-bound participant in the international legal order. In the specific context of cross-border marine waste, Indonesia's duties are sourced from a layered set of norms—constitutional guarantees, statutory obligations, and binding international instruments. On paper, this architecture appears extensive. In practice, however, enforcement in maritime border zones frequently exposes gaps in authority and coordination, both horizontally across sectors and vertically across levels of government.

The 1945 Indonesia Constitution (UUD 1945) is the main law that protects the environment in Indonesia. Article 28H (1) says that "every person has the right to a good and healthy environment," and Article 33(3) says that "natural resources, including the sea, must be controlled by the state and used for the greatest benefit of the people." These policies make the government responsible for protecting the environment, which includes marine ecosystems that are affected by things that happen in other countries [8]. The Constitution requires the creation and enforcement of laws that control pollution, such as waste that crosses or comes from maritime borders.

Law No. 32 of 2009 on Environmental Protection and Management (Law No. 32 of 2009) is the main law that protects the environment in Indonesia. This law sets the precautionary principle, strict liability, and the polluter pays principle as the main ideas for how to run the environment. Article 69 says that you can't throw away trash in the environment, including the sea, unless you have a valid environmental permit. Article 88 also makes entities that harm the environment strictly liable, which means that people can sue them for pollution that crosses borders [9]. In reality, though, these rules are rarely used for marine waste that crosses borders, and enforcement actions are mostly focused on the home country.

Law No. 32 of 2014 on Marine Affairs adds more rules about how to handle marine waste in the maritime world. Article 47 says that the government must stop pollution and damage to the environment in the maritime domain. Other parts of the law require marine spatial planning and zoning. The law also lets the central and local governments set up marine conservation areas, even in areas near the border. However, the implementation of this law has been limited by overlapping jurisdictions and a lack of technical expertise at the local level, particularly in remote or peripheral maritime areas where waste comes in from other countries [10].

Law No. 17 of 2008 on Shipping is also very important for controlling marine waste, especially waste that comes from ships. Indonesia has signed the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), and this law includes Indonesia's obligations under that agreement. Under this regime, ships are not allowed to throw trash, oily waste, or sewage into the sea. Ports must also have facilities to collect waste from ships. But port state control in Indonesia is still not very good, especially in secondary or border-area ports, where these kinds of facilities don't work or aren't there at all [11]. This gap makes it harder for Indonesia to follow MARPOL Annex V, which is about pollution from ships' solid waste and plastic.

Indonesia's responsibilities regarding cross-border marine waste extend beyond domestic law and are grounded in several pivotal international legal instruments, primarily UNCLOS. Law No. 17 of 1985 made UNCLOS official. It sets a number of related duties for coastal states. Article 192 says that everyone has a duty to protect and keep the marine environment safe. Article 194 says that countries must stop, lower, and control pollution of the marine environment from any source, such as pollution from land or ships. More importantly, Articles 197 and 198 require states to work together and let other states know when marine pollution could harm people in other countries.

Despite the normative clarity of these provisions, Indonesia has not fully translated them into an operational strategy for transboundary marine debris. This leaves a practical and legal gap: when marine waste moves across borders—whether by drift patterns or maritime activities—Indonesia's ability to invoke and structure cooperation through legal frameworks remains limited.

This problem is compounded by fragmentation in domestic institutional mandates. Marine environmental governance is distributed across multiple agencies: the Ministry of Environment and Forestry (KLHK) addresses land-based waste streams and general environmental compliance; the Ministry of Marine Affairs and Fisheries (KKP) oversees marine spatial planning, conservation, and aspects of marine governance; and the Ministry of Transportation regulates shipping, ports, and vessel traffic. The division of responsibilities is not inherently problematic, but in the absence of clear leadership and coordinated enforcement, it has produced inconsistencies—especially in outer provinces such as the Riau Islands, where cross-border marine pollution is a recurring concern [12].

A further constraint lies in the absence of a distinct legal category for transboundary environmental harm in Indonesia's domestic system. Current laws provide limited pathways for claims, enforcement measures, or compensation where pollution originates outside Indonesia's jurisdiction but materializes as harm within Indonesian waters. Consequently, local governments and affected communities often lack practical legal recourse when debris is suspected to come from neighbouring states. By comparison, some regional legal systems—such as the European Union—have developed more explicit approaches to cross-border environmental harm and responsibility, offering clearer institutional and legal routes for action [13].

In the end, Indonesia's marine environmental framework is normatively ambitious and broadly aligned with many international standards, yet its application to cross-border marine waste remains uneven and underdeveloped. The core weakness is not the absence of legal texts, but the mismatch between formal commitments and the institutional capacity, coordination, and enforcement tools required to give them effect—particularly in border areas where transboundary pollution is most concentrated. Addressing this gap requires stronger domestic coordination and clearer mandates, alongside more deliberate regional and international engagement so that Indonesia's legal framework becomes not only comprehensive, but practically enforceable.

4.2 National Implementation and Enforcement at Indonesia Border

Indonesia's domestic legal framework offers a substantial normative basis for protecting the marine environment, including rules aimed at controlling waste disposal at sea. The recurring difficulty lies not in the absence of legislation, but in the conditions under which enforcement must operate—particularly in maritime border areas where jurisdictional complexity, operational distance, and cross-border dynamics converge. These constraints are most visible in high-traffic and strategically sensitive zones such as the Strait of Malacca, where transboundary pollution is both frequent and difficult to attribute. This section sets out the relevant regulatory architecture and then evaluates how it functions in practice, with particular attention to coordination among institutions, the effects of decentralization, infrastructure gaps, and the limits of regional cooperation.

Indonesia's approach to border-area waste management is commonly framed as a combination of domestic environmental regulation, spatial planning, and selective cross-border coordination, particularly in coastal areas where transboundary pressures are most pronounced [14]. In regulatory design, coastal spaces are often differentiated into functional zones—such as settlement areas, port zones, and mangrove or conservation belts—with corresponding waste-control measures intended to reduce ecological degradation while maintaining economic activity. Parallel to this zoning approach is a policy emphasis on developing waste treatment and handling facilities in strategic locations, including near border points, so that hazardous waste—whether domestically generated or detected through cross-border movements—can be processed and disposed

of in a controlled manner [15]. In principle, such infrastructure is meant to deter illegal dumping and reduce incentives for informal disposal routes, while strengthening the state's capacity to respond before environmental harm spreads across jurisdictions [14].

Regulatory policy is also complemented by community-facing measures. In border communities, the state has increasingly relied on environmental education and awareness programmes to improve local understanding of the risks posed by improper waste handling and by transboundary waste streams [16]. These initiatives typically focus on the public health and ecological impacts of hazardous waste, including electronic waste and industrial residues that may enter local coastal environments through trade, drift, or unlawful disposal. To extend reach and legitimacy, programmes are often implemented with non-governmental actors and local leaders through workshops and training sessions designed to align community practice with national objectives [16]. Alongside these "soft" measures, enforcement agencies are expected to strengthen controls at border points and maritime crossings to deter smuggling and unauthorized dumping [16]. In policy terms, Indonesia's strategy therefore rests on a three-part logic: prevention through awareness, deterrence through enforcement, and localized participation as a mechanism of compliance support [14].

The statutory foundation for these efforts is extensive. Law No. 32 of 2009 prohibits the unauthorized discharge or disposal of waste into the environment, including marine areas. Law No. 32 of 2014 on Marine Affairs complements this by providing a framework for marine spatial planning and conservation measures. Vessel-based pollution and operational discharges fall primarily under Law No. 17 of 2008 on Shipping, which imposes duties on ship operators and supports the incorporation of international shipping-related pollution standards. These instruments are further supported by Government Regulation No. 19 of 1999 on the Control of Marine Pollution and/or Destruction, as well as implementing regulations issued by the Ministry of Environment and Forestry (KLHK) and the Ministry of Marine Affairs and Fisheries (KKP).

Even with this normative density, implementation remains uneven across the archipelago, and border regions continue to expose structural weaknesses. A persistent issue is the absence of harmonized, cross-sectoral enforcement design. Responsibilities for marine waste management and pollution control frequently overlap, creating fragmented authority and inconsistent interpretations of mandate. Vessel-related waste provides a clear example: enforcement competence may be shared—sometimes ambiguously—between the Ministry of Transportation (as the shipping regulator) and KLHK (as the environmental regulator), producing uncertainty over lead authority, evidentiary standards, and operational protocols in maritime boundary areas.

Institutional fragmentation is therefore not a marginal problem; it is one of the central barriers to effective enforcement. KLHK, KKP, and the Ministry of Transportation operate within partially intersecting domains. In addition, maritime surveillance and interdiction

capacities are held by security actors such as the Indonesian Navy (TNI-AL) and the Marine Police, whose operational presence is essential in border waters but whose roles are not always integrated into civilian environmental compliance frameworks [17]. In practical terms, this produces delays in response, inconsistent enforcement practices, and missed opportunities for coordinated action—especially where incidents require rapid interdiction, evidence preservation, and follow-up enforcement. These difficulties are magnified by Indonesia's geography: the scale of its maritime territory and the remoteness of many border points impose high logistical costs on routine monitoring and make sustained enforcement resource intensive.

The maritime dimension of cross-border waste governance is particularly consequential because much waste movement occurs through shipping lanes and port networks. Regulations prohibit the discharge of hazardous substances at sea and establish protocols to monitor waste transfer through maritime routes [18]. In theory, ports—especially those near border corridors—should serve as key compliance nodes, providing reception and processing facilities and subjecting ships and cargo to environmental checks. Yet the operational reality is uneven. Where port facilities are limited or poorly maintained, the legal prohibition on discharge is difficult to enforce, and compliance incentives weaken. Maritime patrols and surveillance coordinated between security agencies and environmental regulators are intended to compensate for these limitations, but coordination and resourcing remain uneven [19].

Infrastructure development has increasingly been framed through public–private partnerships (PPPs), particularly in border regions where state capacity and financing constraints are most pronounced [14]. PPP models are designed to accelerate the development of waste treatment facilities and to introduce more advanced processing technologies, while distributing costs and operational responsibilities between public authorities and private operators [14]. Where well-regulated, such arrangements can improve technical capacity and support regulatory objectives; where poorly governed, they risk creating accountability gaps or prioritizing cost recovery over environmental performance. Their contribution is therefore contingent on contract design, oversight, and transparency.

Indonesia's regulatory evolution has also been shaped by international standards and “best practice” benchmarking, especially in the management of hazardous waste. Policy alignment with international instruments such as the Basel Convention is frequently invoked as a basis for strengthening controls over transboundary movements of hazardous waste and improving domestic handling standards [18]. Participation in international forums and technical exchanges can provide useful exposure to enforcement tools, tracking technologies, and regulatory models that might be adapted to local conditions [20]. However, policy borrowing is not a substitute for implementation: capacity constraints, coordination failures, and jurisdictional ambiguity can limit how far global standards translate into local practice.

Regional cooperation and diplomacy are increasingly treated as part of the enforcement ecosystem. Indonesia has engaged neighbouring states through bilateral and regional dialogues to address differences in waste standards and to develop shared protocols—particularly with Malaysia, given the intensity of cross-border interactions in the Malacca Strait region [21]. Joint missions, information-sharing arrangements, and capacity-building initiatives can reduce misunderstandings and support practical cooperation. Yet in many instances, cooperation remains non-binding or operationally ad hoc, leaving significant gaps where sustained commitments and compliance expectations are needed.

The linkage between waste governance and border security further shapes Indonesia's regulatory posture. Illegal waste movement is frequently associated with smuggling networks and weak points in border control, which means enforcement is often framed not only as environmental regulation but also as a matter of security and sovereignty [22]. Border security measures—designed to monitor commercial and maritime traffic—are therefore expected to detect and interdict unlawful hazardous material transfers that could cause severe environmental harm [23]. This integrated framing can strengthen political priority and surveillance capacity, but it can also shift emphasis toward interdiction while leaving long-term environmental remediation and accountability mechanisms underdeveloped.

Finally, the multi-sectoral character of cross-border waste governance demands interdisciplinary input. Regulatory design and implementation implicate environmental science (risk and impact assessment), law (liability and jurisdiction), economics (incentives and infrastructure financing), and technology (tracking, monitoring, and treatment systems). Indonesia has sought to reflect this through interdisciplinary working groups and expert consultations intended to generate solutions that do not treat economic development and environmental protection as mutually exclusive [16]. The effectiveness of this approach depends on whether such coordination mechanisms have decision-making authority and are embedded in operational practice, rather than functioning as parallel forums with limited impact.

Overall, Indonesia's border-area marine waste regime illustrates a familiar pattern: a detailed legal framework with broad objectives, coupled with uneven enforcement capacity and fragmented mandates in the very zones where transboundary pressures are greatest. Bridging this gap requires more than additional regulation. It requires clearer allocation of authority, functional coordination across agencies and security actors, investment in border-region infrastructure and monitoring, and regional cooperation frameworks that are sufficiently concrete to support compliance and accountability in practice.

4.3 Waste Management at The Strait of Malacca

The Strait of Malacca is often described as a maritime chokepoint, but in legal and regulatory terms it is also a stress-test: few places concentrate so much commercial traffic, so many overlapping jurisdictions, and such persistent risks of marine pollution. As one of the world's busiest international shipping corridors, it connects the Indian and Pacific Oceans and is jointly bordered by Indonesia, Malaysia, and Singapore. The strait accommodates more than 80,000 vessel transits each year, making it a recurring hotspot for ship-source pollution—including oil spills, operational discharges, garbage disposal, and bilge water release [24]. Although Indonesia has ratified MARPOL and its annexes, translating those commitments into consistent enforcement remains difficult, particularly in areas administered by local port authorities in Aceh and the Riau Islands [25].

Formally, Indonesia's domestic rules are clear. Statutes such as Law No. 32 of 2009 on Environmental Protection and Management and Law No. 17 of 2008 on Shipping prohibit discharges of waste into marine environments absent lawful authorization and require compliance with pollution-control standards. The difficulty is operational. Enforcement in the Malacca Strait is weakened by fragmented mandates across institutions—most notably between the Ministry of Environment and Forestry (KLHK), the Ministry of Transportation, and subnational governments—creating uncertainty over lead authority, evidentiary processes, and response protocols [26]. These institutional overlaps are compounded by limited real-time surveillance capacity. Without reliable monitoring systems to detect shipborne discharges, enforcement is often reactive and episodic, and the likelihood of prosecution for polluting actors remains low.

Regional cooperation, while often cited as a strength in the Malacca Strait, also reveals a conspicuous gap. The Malacca Strait Patrol—undertaken by Indonesia, Malaysia, Singapore, and Thailand—has been designed primarily as a security mechanism, targeting threats such as piracy and armed robbery at sea. It does not operate as an environmental regime, nor does it provide a dedicated structure for routine monitoring of waste discharges or coordinated responses to transboundary marine debris [27]. This mismatch matters: the region has developed collaborative capacity for maritime security, yet has not built an equivalent mechanism for everyday marine pollution control. A targeted tripartite—or broader subregional—environmental arrangement focused on monitoring, reporting, and response for marine waste would therefore fill an evident legal and diplomatic vacuum.

From the perspective of positive law, Indonesia is not lacking in normative coverage. Its domestic framework—especially Law No. 32 of 2009 and Law No. 32 of 2014 on Marine Affairs—includes prohibitions on unauthorized disposal, environmental permitting requirements, and the legal basis for marine zoning and conservation measures [28]. Internationally, Indonesia is also party to key instruments, notably MARPOL 73/78 and UNCLOS, and is therefore bound by obligations under Part XII of UNCLOS and, in the shipping context, by MARPOL Annex V's rules on garbage and plastics alongside other annexes relevant to ship-source pollution [29]. The persistent problem is that these

commitments are not consistently converted into local enforcement capability in the border areas where risks are concentrated.

The Riau Islands illustrate this implementation gap in concrete terms. Under Indonesia's decentralization framework (including Law No. 23 of 2014), provincial authorities have defined responsibilities in coastal management and environmental administration, including permit-related functions. Yet the province lacks sufficient surveillance infrastructure, patrol assets, and monitoring technology to ensure compliance in practice—particularly in relation to foreign-flagged vessels operating in or near boundary waters [30]. Local environmental agencies, including the *Dinas Lingkungan Hidup of Riau Islands Province*, operate under tight fiscal constraints, limiting routine inspections, rapid response capacity, and sustained monitoring of illegal dumping or accidental discharges.

Geography and diplomacy further complicate governance. The Riau Islands sit in close proximity to Singapore, a neighbouring state with comparatively stringent port and environmental regulation. Yet Indonesia and Singapore do not have a dedicated bilateral agreement focused specifically on marine pollution control or joint monitoring for routine waste discharges in shared and adjacent waters. Cooperation exists through arrangements such as the Tripartite Technical Experts Group (TTEG) on the Straits of Malacca and Singapore, but its practical emphasis has tended to centre on navigational safety, piracy-related concerns, and major incident response—particularly oil spill preparedness—rather than systematic marine debris monitoring and day-to-day discharge compliance [31]. In regulatory terms, this leaves space for jurisdictional evasion: where enforcement is uneven and cooperative frameworks are non-binding or narrowly scoped, polluting actors may exploit gaps in monitoring and accountability [32].

The problem is not only ship-source pollution. Land-based waste systems in the Riau Islands remain underdeveloped, especially in rapidly urbanizing and industrializing centres such as Batam and Bintan. These areas face growth pressures that outpace waste collection and treatment capacity, and illegal dumping near coastlines is widely reported [33]. This creates a steady leakage of solid waste into surrounding waters—waste that can drift across boundaries and, in turn, complicate Indonesia's diplomatic posture by blurring the line between “imported” marine debris and pollution generated domestically.

These realities support a clear reform direction. At the external level, there is a strong case for a bilateral or subregional instrument focused specifically on marine debris and waste management between Indonesia and Singapore, potentially building on the institutional relationships already established through the TTEG. Such an arrangement could include joint surveillance operations, shared incident reporting and data platforms, harmonized port reception expectations, and agreed protocols for investigation and enforcement follow-up. Internally, the central government should treat the Riau Islands as a frontline environmental jurisdiction adjacent to a major global maritime hub, and

allocate greater financial, technical, and surveillance resources accordingly—particularly to strengthen monitoring capacity and inter-agency response coordination.

Ultimately, the Riau Islands case demonstrates why cross-border marine waste cannot be addressed through legal text alone. Effective governance requires vertical alignment between Jakarta and subnational authorities, and horizontal cooperation with neighbouring states in the zones where pollution risks are most concentrated. Without these two forms of coordination, the gap between Indonesia's legal commitments—constitutional, statutory, and treaty-based—and operational outcomes will remain entrenched, undermining both Article 28H(1)'s constitutional promise and Indonesia's obligations under UNCLOS and MARPOL. The region's escalating challenges, including allegations of oil waste dumping linked to transboundary industrial activities, further underline the need for a harmonized, multi-stakeholder approach that treats environmental protection as a core component of maritime governance in the Malacca Strait corridor.

5 Conclusion

Indonesia's struggle with transboundary marine waste highlights a clear governance gap. The country has a strong legal framework grounded in constitutional duties, environmental and maritime laws, and binding treaties such as UNCLOS and MARPOL. However, enforcement is inconsistent, especially in border areas where cross-border pollution is most severe. The main problem is not a lack of laws, but rather weak institutions and operations. Overlapping responsibilities among ministries, poor coordination between environmental and maritime security agencies, and challenges posed by decentralization have reduced accountability and slowed action. In border regions, these issues are exacerbated by difficult terrain, heavy ship traffic, and the challenge of tracing waste to its source. As a result, strict liability and permit systems look good on paper but are not as effective in practice.

The gap between legal policies and enforcement is especially clear in the Strait of Malacca and the Singapore–Riau corridor. Although regional cooperation is possible, most efforts have focused on navigation safety and security rather than on consistent environmental rules or the management of marine litter. To close this gap, Indonesia needs to move from ambitious laws to real enforcement. This means giving agencies clearer roles and creating a strong system for coordination, including detection, evidence gathering, and penalties. It also requires ongoing investment in surveillance, port waste facilities, and enforcement in border areas. Internationally, Indonesia should move from informal cooperation to formal agreements with neighbors, including joint monitoring, shared data, coordinated investigations, and agreed enforcement steps. Making marine environmental protection a greater part of marine diplomacy and using UNCLOS tools when needed would help hold parties accountable for cross-border pollution.

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