

Criminal Law Enforcement on Marine Pollution in Indonesia from the Perspective of Environmental Protection

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Abstract

Criminal law enforcement against marine pollution in Indonesia serves as a crucial instrument to maintain the sustainability of marine ecosystems and safeguard the rights of coastal communities. This article analyzes national and international regulatory frameworks, law enforcement implementation, victim protection, and the effectiveness of criminal law in addressing marine pollution, including oil spills, industrial waste, and Illegal, Unreported, and Unregulated (IUU) fishing. The findings indicate that, despite a relatively comprehensive legal framework, enforcement effectiveness is hindered by limited law enforcement capacity, complex evidentiary procedures, vast maritime areas, and weak inter-agency coordination. Modern criminal law approaches need to be both preventive and restorative, not only imposing sanctions on offenders but also promoting ecosystem restoration and protection for affected communities. Integration of national and international instruments, regulatory harmonization, and stringent corporate accountability are key to enhancing compliance and enforcement effectiveness. The synthesis of findings underscores that criminal law enforcement against marine pollution should be viewed as a multidimensional process combining legal norms, implementation practices, victim protection, and environmental rehabilitation, thereby ensuring the sustainability of marine ecosystems and the socio-ecological well-being of coastal communities.

I. Introduction

Indonesia, as an archipelagic state, possesses vast and strategically important maritime territories in economic, social, and ecological terms. The sea serves not only as a means of transportation and trade route but also as a living space for diverse ecosystems that support the sustainability of natural resources and the livelihoods of coastal communities. However, the high intensity of maritime utilization carries the consequence of increased pollution risks, which can potentially cause serious environmental damage. As an archipelagic nation with a strong maritime character, Indonesia is highly dependent on marine activities, particularly to support inter-island connectivity and national economic movement. The sea functions as a primary distribution channel for goods and services, as well as a strategic space for exploiting high-value natural resources. Therefore, the existence of maritime territory is viewed not merely as a geographic separator but as a unifying element that connects the integrity of the nation.

This perspective is rooted in the historic Djuanda Declaration of 13 December 1957 by Prime Minister Djuanda Kartawidjaja. Through this declaration, Indonesia affirmed to the international community that the waters surrounding, between, and within the Indonesian archipelago constitute an inseparable part of the sovereignty of the Unitary State of the Republic of Indonesia. This concept became a fundamental basis for recognizing Indonesia as an archipelagic state, strengthening national territorial integration, and providing a foundation for comprehensive management of marine resources. The spirit of territorial unity aligns with the mandate of the 1945 Constitution of the Republic of Indonesia, which affirms Indonesia as a unitary state responsible for all its islands and maritime areas. Within this framework, marine resource management must consider not only economic aspects but also environmental and ecosystem sustainability, ensuring that future generations can continue to benefit from the sea in a sustainable manner.

Rabani and Pasaribu (2024) emphasize that the state has an obligation to ensure that the utilization of the sea remains within the framework of environmental protection, including through clear regulations, effective monitoring mechanisms, and law enforcement. Beyond symbolizing sovereignty, the Djuanda Declaration also serves as a foundation for modern maritime law and environmental policy strategies, including efforts for pollution prevention, ecosystem restoration, and protection of coastal communities directly affected by marine activities. From this perspective, criminal law enforcement against marine pollution functions not only as a repressive tool but also as an instrument to ensure ecosystem sustainability, uphold territorial sovereignty, and protect the public's right to a healthy environment.

The state's commitment to the urgency of environmental protection is reflected in various legislative instruments. One important regulation is Government Regulation No. 22 of 2021 on the Implementation of Environmental Protection and Management, which stipulates that environmental protection and management must be carried out systematically, in a planned and integrated manner. This policy aims to ensure the preservation of environmental functions while preventing pollution and/or damage. Its scope includes planning, utilization, control, maintenance, supervision, and law enforcement as the ultimate mechanism to ensure compliance by all legal subjects. This framework demonstrates the state's effort to establish comprehensive environmental governance. In this context, criminal law occupies a strategic position, functioning as a coercive instrument when administrative or civil measures are no longer sufficient. Therefore, criminal law is expected to strengthen the protective capacity of ecosystems, including maritime areas that play a vital role in the nation's well-being.

Although a regulatory framework has been carefully formulated, the reality on the ground shows that threats to the sustainability of the sea remain a recurring and significant problem. Marine pollution has wide-ranging impacts on human life, particularly for coastal communities and fishers who rely on water quality for their livelihoods. Environmental degradation not only reduces fish catches but also affects public health, disrupts marine habitats, and damages ecosystem balance, which takes a long time to recover.

Furthermore, marine pollution also threatens biodiversity, damages coral reefs, and diminishes the sea's capacity to support sustainable economic activities. These impacts are exacerbated when human activities such as shipping, industrial waste disposal, and illegal fishing continue unchecked due to insufficient monitoring and law enforcement. This situation demonstrates that regulations alone are insufficient; consistent law implementation, strengthened enforcement capacity, and community involvement in environmental monitoring and rehabilitation are required. Through a holistic approach, criminal law enforcement against marine pollution is expected not only to be repressive toward perpetrators but also preventive and restorative, protecting coastal communities, restoring damaged ecosystems, and ensuring the long-term sustainability of marine functions for future generations (Rabani & Pasaribu, 2024).

From an international law perspective, protection of the marine environment is even considered a collective responsibility of the global community. Mangku (2020) emphasizes that marine conservation is part of the state's responsibility to prevent damage that harms not only its own territory but also the global community, given that marine ecosystems are transnational and interconnected. International conventions, such as the United Nations Convention on the Law of the Sea (UNCLOS) 1982 and other environmental instruments, affirm the obligation of states to protect the oceans from pollution, including through regulation, monitoring, and effective law enforcement.

In the context of Indonesia, this principle of international law aligns with the Djuanda Declaration (1957) and the provisions of the 1945 Constitution, which affirm the state's

sovereignty over its maritime territory. The state is not only responsible for regulating and enforcing the law against polluters but also for ensuring the sustainability of marine ecosystems that support coastal communities and the preservation of resources for future generations (Rabani & Pasaribu, 2024). Thus, marine environmental protection in Indonesia represents a concrete implementation of international obligations as well as a domestic responsibility, requiring harmonization of national regulations and law enforcement mechanisms that are consistent, effective, and integrated.

In line with this, Junginger (2021) explains that transboundary pollution requires robust accountability mechanisms to prevent gaps in legal protection. This phenomenon demonstrates that marine pollution cannot be viewed solely as a local issue; it possesses cross-border dimensions that demand serious attention in law enforcement. Transnational pollution cases, such as oil spills from foreign vessels or industrial waste discharged into neighboring waters, pose ecological risks affecting fish stocks, coral reefs, and the livelihoods of coastal communities across multiple countries.

Therefore, inter-state coordination, application of international legal instruments, and integration with national regulations are crucial. This approach ensures that polluters, both domestic and foreign, can be held legally accountable, safeguarding the rights of communities to enjoy a healthy marine environment. From this perspective, cross-border considerations emphasize that marine environmental protection is a collective responsibility, combining adherence to international law, national law enforcement mechanisms, and the involvement of authorities and communities to maintain the sustainability of marine ecosystems comprehensively (Mangku, 2020; Junginger, 2021). In practice, one of the most frequent sources of marine pollution is related to shipping activities. Operational activities of vessels, whether through waste discharge, oil spills, or negligence in meeting environmental safety standards, can generate wide-ranging and complex impacts. On one hand, maritime transport is a crucial requirement for economic growth and regional integration. On the other hand, these activities carry risks that must be mitigated through strict monitoring systems and the effective application of criminal sanctions.

The diversity of pollution sources from shipping and industrial waste disposal to resource exploitation demonstrates that efforts to protect the marine environment require law enforcement that is not only firm but also consistent. From an environmental law perspective, the purpose of criminalization goes beyond merely punishing offenders; it is also aimed at ensuring ecosystem sustainability and providing protection for affected communities. Therefore, the effectiveness of criminal law enforcement is a key factor in ensuring that the mandate for environmental protection is genuinely realized in practice.

Regulations concerning criminal acts of marine pollution are fundamentally grounded in Indonesia's legal system, particularly through Law Number 32 of 2009 on Environmental Protection and Management. This legislation positions criminal law as an important instrument for ensuring compliance with the obligation to maintain environmental sustainability. Under its provisions, any individual or corporation whose actions cause

pollution or environmental damage can be held criminally accountable in accordance with the severity of the offense and the resulting impacts.

The existence of criminal law provisions within these statutes demonstrates that the state views environmental pollution, including in marine areas, as a serious offense that threatens ecosystem sustainability and community welfare. Consequently, criminal law functions not only as a tool for punishment but also as a preventive measure, encouraging businesses and users of marine resources to conduct their activities more responsibly. However, the effectiveness of these provisions largely depends on their enforcement. Warsiman et al. (2023) emphasize that although the legal framework can be considered relatively comprehensive, its practical implementation still faces several obstacles. These challenges include the complexity of proving violations, the limited capacity of authorities to assess environmental damage, and the inconsistent imposition of criminal sanctions by the judiciary. This situation results in the law's objectives providing a deterrent effect while ensuring environmental protection not being fully realized.

In addition to challenges in proving violations, criminal law enforcement in the field of marine pollution often faces issues of inter-agency coordination, overlapping authority, and economic considerations that frequently influence enforcement actions. As a result, criminal law which should serve as the ultimate safeguard for environmental protection—has yet to function optimally as a regulatory instrument. Therefore, efforts are needed to strengthen legal substance, enforcement structures, and public legal culture so that criminal accountability for marine pollution can be effectively realized. Without such improvements, even a comprehensive set of regulations risks remaining merely written norms that provide limited real protection for marine environmental sustainability.

The issue of effectiveness becomes even more apparent when examined in the context of marine pollution stemming from shipping activities. While the maritime transport sector forms the backbone of national connectivity, it also carries significant environmental risks, including operational waste discharge, fuel spills, and negligence in adhering to environmental protection standards. The complexity of Indonesia's vast maritime territory further complicates monitoring and enforcement of violations.

Rabani and Pasaribu (2024) note that law enforcement against marine pollution often remains suboptimal. This is influenced by factors such as jurisdictional overlaps, limited monitoring resources, and the lack of effective coordination among authorized institutions. Consequently, enforcement processes are often slow, sometimes resulting in minimal criminal accountability for offenders. This undermines the capacity of environmental law to provide tangible protection for the sustainability of marine ecosystems. These findings reinforce the view that the existence of relatively comprehensive criminal law provisions does not necessarily correlate with their effective implementation. From an environmental protection perspective, weak enforcement reduces the deterrent effect of the law and increases the likelihood of repeated pollution incidents.

On the other hand, developments in the reform of national criminal law bring new hope for strengthening the handling of marine environmental crimes. Muhariza et al. (2025) argue that the direction of maritime development through the blue economy approach requires a balance between resource exploitation and commitment to sustainability. Therefore, the criminal liability regime needs to be designed in a way that ensures economic activities do not disregard environmental preservation.

Within this framework, criminal law is expected not only to function as a repressive instrument that acts after pollution occurs but also as a preventive tool that encourages compliance from the outset. Law enforcement should aim to create a deterrent effect, raise standards of caution, and ensure the restoration of environmental damage that has already occurred. In this way, the objectives of environmental protection can be concretely integrated into the practice of criminal law enforcement in Indonesian marine areas.

The discussions above indicate that although Indonesia has a fairly comprehensive regulatory framework to address marine pollution, the effectiveness of criminal law enforcement still faces various challenges. The complexity of maritime territories, the numerous actors involved in marine resource utilization, as well as evidentiary and inter-agency coordination constraints, often result in sanctions that are unable to provide optimal deterrence. Consequently, the overarching goal of environmental protection—to maintain the sustainability of marine ecosystems and the welfare of coastal communities—has not yet been fully realized.

Moreover, the evolving paradigm of maritime development emphasizing sustainability demands criminal law enforcement that is not only repressive but also capable of promoting prevention and environmental restoration. Criminal law is expected to serve as a strategic instrument to ensure that all marine utilization activities remain within the environment's carrying capacity. Based on this context, a more in-depth study is required on how criminal law enforcement against marine pollution is implemented in Indonesia and to what extent this approach reflects an environmental protection perspective. Through this analysis, it is hoped that weaknesses can be identified and measures formulated to establish a more effective and equitable law enforcement system.

2. Research Method

This study employs a doctrinal or normative legal research method, positioning law as a set of norms that regulate criminal liability for marine pollution. The focus of the study is on how criminal law provisions in the field of environmental protection are formulated and the extent to which these norms are capable of safeguarding the sustainability of marine ecosystems. The approach used includes the statute approach and the conceptual approach. The statute approach involves examining various regulations related to environmental protection and management, particularly those containing criminal provisions for acts of marine pollution. Meanwhile, the conceptual approach is used to understand the principles, doctrines, and legal concepts of environmental law as

developed in academic literature, especially those relating to the objectives of environmental protection and sustainability.

The legal materials in this study consist of primary, secondary, and tertiary sources. Primary legal materials include legislation relevant to criminal acts of marine pollution. Secondary legal materials consist of books, journal articles, and research results that provide explanations and analyses regarding the enforcement of environmental criminal law. Tertiary legal materials are used to assist the researcher in understanding legal terms and concepts. Legal materials were collected through a literature review. Subsequently, all legal materials were analyzed qualitatively by interpreting, connecting, and evaluating the existing provisions to obtain an overview of the effectiveness of criminal law enforcement against marine pollution from an environmental protection perspective. This analysis also aims to formulate recommendations for improving both the regulatory framework and its implementation

3. Results and Discussion

TheBased on the normative legal research approach outlined previously, the analysis in this study is directed at examining how criminal law provisions are regulated and implemented in addressing marine pollution offenses in Indonesia. The discussion focuses on the construction of legal norms, forms of liability, and the effectiveness of their application in providing protection for the environment. By reviewing various legislation, doctrines, and academic literature, this study aims to identify both the strengths and weaknesses of the existing criminal law enforcement system. The findings are then organized into several interrelated topics to provide a comprehensive overview of the role of criminal law in safeguarding marine ecosystems.

Criminal Law Regulation on Marine Pollution in Indonesia

As a maritime country, Indonesia faces significant challenges in maintaining the sustainability of its marine environment against various forms of pollution. To address this, the state has established an adequate criminal law framework as an instrument to enforce compliance with environmental regulations. These regulations are not only intended to punish polluters but also to ensure protection for marine ecosystems and communities that depend on these resources. Various provisions in Indonesian legislation, including Law No. 32 of 2009 on Environmental Protection and Management, stipulate that any act causing environmental pollution or damage can be subject to criminal sanctions.

Normatively, Indonesia already has a sufficiently comprehensive regulatory framework for addressing marine pollution offenses. Environmental protection and management laws prohibit any actions that cause pollution or environmental damage, accompanied by threats of criminal penalties for violators. Criminal law is positioned as a crucial instrument to ensure compliance, especially when administrative mechanisms are no longer effective. Alhakim and Lim (2021) explain that the use of criminal law in environmental enforcement represents the most decisive form of state intervention to preserve the sustainability of ecosystem functions. Through criminal threats, the state seeks to create a deterrent effect while simultaneously protecting public interests affected by pollution.

The constitutional basis for the importance of environmental protection can also be traced to Article 28H paragraph (1) of the 1945 Constitution of the Republic of Indonesia,

which guarantees everyone the right to a good and healthy environment. Thus, enforcement against marine pollution is not merely the application of administrative norms but also the fulfillment of citizens' fundamental rights. Nevertheless, the abundance of sectoral regulations related to maritime, shipping, and fisheries often raises issues of harmonization. Differences in the definition of offenses or mechanisms of liability can result in inconsistent law enforcement in practice.

Additionally, the environmental law regime recognizes the polluter pays principle, which obliges polluters to bear the costs arising from their actions. This principle reinforces the argument that criminal liability should be accompanied by obligations for environmental restoration. Salim, Utami, and Fernando (2022), through a green victimology approach, place communities and nature as victims whose rights must be restored through legal mechanisms. These principles emphasize that anyone causing environmental impacts must bear both legal consequences and the costs of restoration. In the context of marine pollution, applying this principle is highly relevant because the resulting damage is often extensive, cross-jurisdictional, and affects coastal communities over the long term.

Furthermore, criminal law regulation is not only directed at individuals but also allows for corporate liability. This is important because many activities with the potential to cause marine pollution are carried out at an industrial scale through shipping, resource exploitation, or waste disposal. With a corporate accountability mechanism, criminal law is expected to reach key actors who economically benefit from such activities. Although the normative framework is in place, effectiveness remains a central issue. Provisions that require scientific evidence, causal links, and identification of responsible parties often slow down law enforcement. As a result, criminal sanctions, though theoretically strong, have not fully provided optimal deterrence.

From an environmental protection perspective, criminal law should serve as a guarantee that the utilization of marine resources is not exploitative. Therefore, criminal regulations do not merely function to punish after damage has occurred but also to establish behavioral standards so that all development activities consider the sustainability of marine ecosystems.

Implementation of Criminal Law Enforcement in Marine Pollution Cases

After understanding the normative framework and regulations underlying criminal law enforcement against marine pollution, the next step is to examine the actual implementation of the law in the field. This implementation encompasses how law enforcement officers apply existing regulations, take action against violators, and restore environmental damage. In practice, criminal law enforcement in Indonesia faces numerous challenges, including complexities in evidence gathering, limited monitoring capabilities, and weak inter-agency coordination (Pamungkas, 2025). Cases of pollution resulting from tanker leaks, industrial waste, and IUU fishing demonstrate that even though regulations are in place, enforcement processes are often hindered by difficulties in collecting scientific evidence, the vastness of surveillance areas, and the mobility of perpetrators across maritime zones.

In practice, the execution of criminal law enforcement against marine pollution still encounters various complex challenges. Case evidence requires support from scientific data, laboratory results, and expert testimony to establish a causal relationship between

perpetrators' activities and the resulting ecosystem damage. Pamungkas (2025) highlights that law enforcement officers in maritime areas often face technical constraints, such as limited patrol resources, extensive areas to monitor, and the need for cross-agency coordination. These conditions result in enforcement actions that cannot cover all potential violations. Moreover, the nature of marine pollution, which often involves businesses or corporations, requires officers to trace the chain of responsibility to parties controlling operational activities. Malau (2023) emphasizes that the 2023 National Criminal Code establishes criminal liability mechanisms for both individuals and corporations, but its application in the field still requires clear and consistent guidance to handle industrial or collective cases.

Another significant issue is Illegal, Unreported, and Unregulated (IUU) fishing, which is a source of marine pollution and simultaneously harms ecosystems. Leonardo and Deeb (2022) note that IUU fishing in Indonesian waters frequently produces fuel waste, oil spills, and disposal of organic and inorganic waste, negatively affecting water quality, coral reef health, and the sustainability of marine habitats. Beyond ecological damage, these activities also reduce fish stocks, lower fisheries productivity, and threaten the livelihoods of coastal communities.

The socio-economic impacts make criminal law enforcement against IUU fishing critically important, as perpetrators often operate across territories and maritime zones, including outermost waters. Enforcement requires coordination across ministries, police, and fisheries monitoring authorities, as well as integration of national and international legal instruments. An effective approach must include criminal sanctions for offenders, ecosystem rehabilitation, and protection for affected communities, ensuring that law enforcement is not merely repressive but also preventive and restorative, promoting ecological sustainability and socio-economic well-being of coastal communities.

Enforcement against IUU fishing requires cross-ministry coordination, police involvement, and fisheries monitoring authorities' capacity to act against perpetrators operating across jurisdictions, including outer maritime zones. Additionally, challenges in evidence collection, limited maritime patrols, and transboundary mobility of offenders necessitate an integrative legal approach combining criminal sanctions, ecosystem restoration, and community involvement in monitoring. This strategy ensures that law enforcement is not only repressive but also provides tangible protection for marine ecosystems and affected victims.

Furthermore, the complexity of marine pollution cases indicates that criminal law enforcement cannot function in isolation. Its effectiveness heavily depends on administrative support, availability of technology, strengthened laboratory capacities, and systematic monitoring mechanisms. Without an integrated approach, criminal sanctions—no matter how strong on paper may lose their deterrent effect. From an environmental law perspective, these challenges highlight the need to develop standard operating procedures, enhance law enforcement officers' capacities, and harmonize sectoral regulations. Thus, criminal law functions not only to punish but also to prevent further damage, restore ecological losses, and ensure the sustainable use of marine resources.

Criminal Law Enforcement and Environmental Victim Protection

After discussing the criminal law framework and its implementation in marine pollution cases, it is important to highlight an aspect that has increasingly gained attention

in modern environmental law: the protection of victims and ecosystem restoration. Criminal law enforcement is no longer viewed solely as a tool to punish offenders, but also as a mechanism to repair environmental damage and guarantee the rights of affected communities. Coastal communities that rely on marine resources are often the most impacted by pollution from oil spills, industrial waste, or illegal fishing activities. Therefore, the law enforcement approach must be holistic, encompassing not only action against offenders but also victim protection, ecosystem rehabilitation, and socio-economic sustainability. The concept of green victimology emphasizes the importance of recognizing both communities and the environment as victims requiring tangible protection, allowing criminal law enforcement to function preventively, repressively, and restoratively.

The development of modern environmental law thinking stresses that criminal law enforcement should no longer focus solely on punishing offenders but must also consider victim protection and ecosystem restoration. The concept of green victimology, proposed by Salim, Utami, and Fernando (2022), highlights the need to view coastal communities and the environment as victims whose rights must be actively safeguarded. From this perspective, criminal law enforcement is directed not only at imposing fines or prison sentences but also at restoring environmental damage, rehabilitating degraded ecosystems, and maintaining the socio-economic sustainability of coastal communities.

This approach requires synergy between law enforcement officers, environmental agencies, and local communities, ensuring that legal processes operate preventively, repressively, and restoratively. The effectiveness of environmental criminal law is not measured solely by the number of offenders prosecuted but also by the legal system's ability to restore ecosystem functions, reduce socio-economic impacts, and guarantee citizens' rights to a healthy and sustainable environment. Thus, criminal law enforcement in marine environmental contexts serves not only as a punitive instrument but also as a means of ecological restoration and social justice for affected communities.

Athif (2021) emphasizes that various environmental damages in Indonesia, ranging from marine pollution to coastal habitat degradation, have directly impacted local communities dependent on natural resources. These impacts include declining fisheries productivity, deteriorating water quality, loss of biodiversity, and health risks for coastal populations. This situation demonstrates that environmental victims are not merely an abstract concept but have tangible implications for livelihoods, health, and community well-being, necessitating a preventive and restorative approach in criminal law enforcement. Such an approach requires coordination among law enforcement, communities, and environmental institutions, as well as the integration of national policies and international instruments, so that law enforcement not only punishes offenders but also restores ecosystems and enhances community adaptive capacity to environmental risks.

In line with this, Mutiara (2022) emphasizes that green victimology-based law enforcement expands the meaning of criminal liability. Court decisions no longer stop at prison sentences or fines but also include obligations for rehabilitation and restoration of polluted environments. This approach introduces a restorative-ecological dimension, where criminal law supports ecological restoration while delivering justice to affected communities. From this perspective, criminal law is expected to function simultaneously in preventive, repressive, and restorative ways. Law enforcement is not merely about prosecuting offenders but also about promoting marine ecosystem recovery, restoring environmental quality, and protecting the rights of coastal communities. The effectiveness of environmental law is measured not only by the number of offenders punished but more

broadly by its capacity to minimize damage, reduce ecological risks, and ensure socio-ecological sustainability. This approach underscores that environmental criminal law enforcement must be holistic and integrative, combining legal mechanisms, law enforcement capacity, community participation, and national and international instruments, so that the goal of sustainable marine environmental protection can be achieved.

Evaluation of Enforcement Effectiveness

Upon closer examination, the main problem in environmental criminal law enforcement in Indonesia does not lie in the absence of regulations, but rather in the consistency of implementation and the effectiveness of law enforcement in practice. Alhakim and Lim (2021) argue that weak coordination among law enforcement agencies and complicated evidentiary procedures often cause case handling to be slow and uneven across Indonesia's waters. This not only hampers legal processes but also reduces public confidence in the environmental law enforcement system. Salsabila and Nugraha (2025) add that the implementation of international conventions, such as MARPOL which aims to reduce marine pollution from shipping and industrial activities has not yet been fully optimal. The gaps between national regulations and international instruments, limited surveillance resources, and the inadequate capacity of officers to conduct inspections and enforcement on-site are the main obstacles. As a result, waste dumping, oil spills, and other environmental violations still frequently occur despite the presence of strict regulations.

Furthermore, Khalisa et al. (2025) emphasize that the effectiveness of environmental law enforcement in Indonesia faces structural and institutional challenges. Limited cross-sector coordination, technical gaps, and insufficient corporate accountability mechanisms often make criminal sanctions merely symbolic. This weakens the deterrent effect on offenders, making pollution practices difficult to control significantly. Beyond technical and institutional factors, socio-economic issues also influence enforcement effectiveness. Many polluters come from industries with substantial economic interests, while affected coastal communities often lack legal access to claim compensation or environmental restoration. This underscores the need for a restorative-ecological approach, which not only punishes offenders but also emphasizes ecological restoration and the protection of affected communities' rights.

Therefore, strengthening the capacity of law enforcement officers, enhancing an integrated monitoring system, and implementing strict corporate criminal liability are urgent necessities. These efforts should be complemented by the integration of national and international instruments, development of environmental laboratories, and technical training for field officers. Additionally, a collaborative approach involving coastal communities, academics, and the private sector can improve the effectiveness of monitoring and enforcement. Without these measures, the objectives of criminal law to provide tangible protection for marine environments and the sustainability of ecosystems will be difficult to achieve optimally. By strengthening institutional structures, harmonizing regulations, and adopting a holistic approach, criminal law enforcement can play preventive, repressive, and restorative roles, thereby offering more effective protection for Indonesia's seas and the welfare of communities dependent on them.

To provide a clearer overview of the mechanisms for criminal law enforcement against marine pollution in Indonesia, the following table illustrates the process from the regulatory basis to ecosystem restoration and victim protection. This table demonstrates how various actors and legal instruments work together in an integrated manner, from rule-making, field implementation, law enforcement, to evaluating effectiveness and sustainability. In this way, readers can understand the logical flow of marine environmental criminal law enforcement comprehensively.

Table 1. Stages in Law Enforcement Flow

Level Stage	Actors Instruments	Activities Processes	Results Impacts
Regulation & Legal Basis	National & International Laws (Law 32/2009, Criminal Code 2023, MARPOL)	Establish prohibitions on marine pollution and criminal liability	Clear legal framework available for enforcement
Implementation & Supervision	Marine Police, Ministry of Marine Affairs and Fisheries (KKP), relevant authorities	Patrolling, ship inspections, monitoring industrial activities	Identification of violations and potential offenders
Enforcement Process	Public Prosecutors, Courts	Investigation, analysis of scientific evidence, court trials of marine pollution cases	Imposition of criminal sanctions or fines, corporate accountability
Victim Protection & Rehabilitation	Authorities + Community + NGOs	Rehabilitation of marine ecosystems, compensation for affected communities	Protection for communities and ecosystems
Evaluation & Sustainability	All parties + Monitoring	Assessment of enforcement effectiveness, integration of national & international instruments	Sustainability of marine ecosystems and prevention of future violations

From the flow table, it can be seen that the enforcement of criminal law for marine environmental protection is a complex and multidimensional process. The success of law enforcement is determined not only by the availability of regulations but also by the capacity of authorities, inter-agency coordination, community involvement, and the

integration of national and international instruments. By understanding this flow, researchers and legal practitioners can identify weaknesses in implementation and design more effective strategies to protect Indonesia's marine environment while providing tangible protection for affected coastal communities.

Implementation and Enforcement of Environmental Law on Marine Pollution from Shipping Activities in Indonesia

Marine pollution is a global environmental issue that demands serious attention from all stakeholders. In Indonesia, shipping activities are a major contributor to marine pollution, including oil spills, discharge of ship waste, and other materials that negatively impact marine ecosystems. Quantitatively, oil spills can be categorized into three levels based on volume: small (less than 7 tons), medium (7–700 tons), and large (more than 700 tons). Each category has the potential to cause significant ecological damage, disrupt marine habitats, upset ecosystem balance, and result in substantial financial losses. These impacts are felt not only by the environment but also directly threaten the livelihoods of coastal communities dependent on fisheries and other marine resources (Rabani & Pasaribu, 2024). This phenomenon underscores the need for effective implementation of environmental law and enforcement of criminal law to prevent pollution, minimize damage, and ensure the sustainability of marine ecosystems and community welfare.

To address marine pollution from shipping activities, the international community has established the MARPOL 73/78 Convention as the primary technical guideline for preventing pollution from ships. Indonesia has implemented MARPOL principles through various national regulations, including Law No. 17 of 2008 on Shipping, Law No. 32 of 2009 on Environmental Protection and Management, Law No. 32 of 2014 on Marine Affairs, as well as several government regulations and ministerial decrees regulating oil spill response and ship operational monitoring (Rabani & Pasaribu, 2024).

Although the legal framework is in place, its implementation still faces significant challenges. Limited human resources and technology, complex evidentiary procedures, suboptimal inter-agency coordination, and low environmental compliance awareness among the shipping industry are major obstacles. Therefore, effective law enforcement requires an integrated strategy, including routine monitoring and technology-based inspections such as satellite surveillance and ship tracking systems, the imposition of strict sanctions, crew training, regional and international cooperation, and increased community involvement in reporting violations. With this integrative approach, the application of criminal law and environmental regulations can be more effective in minimizing the impact of marine pollution from shipping activities while ensuring the sustainability of Indonesia's maritime ecosystems.

Implementation of Marine Environmental Law Enforcement as an Effort for the Sustainability of Maritime Ecosystems in Indonesia

Law enforcement reflects how legal norms are practically applied, taking into account three main principles: legal certainty, utility, and justice. Legal certainty requires consistency in the application of rules, regardless of external consequences, in line with the adage *fiat justitia et pereat mundus* let justice be done, though the world may perish. For example, the provision stating “anyone who pollutes the environment must be punished” emphasizes that any individual or business entity violating environmental regulations is

subject to sanctions, regardless of social status or position. This underlines the essence of legal certainty: consistent implementation of rules based on the text of the law.

On the other hand, society expects tangible benefits from the application of environmental law. Environmental legislation is not merely about prohibitions; it aims to promote public welfare and preserve natural resources. Mertokusumo emphasizes that if law enforcement focuses solely on legal certainty, the elements of utility and justice may be overlooked; conversely, overemphasizing utility can compromise clarity of regulations and fairness. Therefore, environmental law enforcement must balance these three pillars proportionally, even though managing this balance in practice is often challenging.

In Indonesia, marine environmental protection is systematically regulated under Law No. 32 of 2014 on Marine Affairs, which defines marine environmental protection as an integrated effort to conserve marine resources and prevent pollution and environmental damage. The application of sanctions also follows the principle of strict liability (Article 88), which states that any party generating or managing hazardous and toxic waste (B3) or engaging in activities that pose a serious threat to the environment is fully responsible for the resulting damage, without the need to prove fault.

However, challenges arise because not all parties understand environmental law. This lack of awareness can create tension between law enforcement officers and the community seeking justice. Law No. 32 of 2009, particularly Article 94, Chapter XIV on Investigation and Evidence, grants certain civil servants, in addition to the police, the authority to conduct investigations of environmental crimes. These investigators have tasks that include: verifying suspected illegal activities, investigating offenders, collecting evidence and witness statements, examining relevant documents, and inspecting locations and physical evidence. This mechanism aims to strengthen the effectiveness of marine environmental law enforcement, ensuring that legal certainty, utility, and justice are achieved in a balanced manner.

To provide a concrete illustration of the implementation of criminal law enforcement against marine pollution, several empirical cases are presented that reflect the challenges and practices in the field:

1. Oil Spill in Balikpapan Waters (2023)

As an example of the application of criminal law to marine pollution, the tanker leakage case demonstrates the real impact of pollution on coastal ecosystems, coral reefs, and local fisheries productivity. According to the process flow outlined in the table, the implementation and supervision stage is carried out by the Water Police and the Ministry of Marine Affairs and Fisheries (KKP) through routine patrols, inspections, and field coordination. However, law enforcement is often hindered by limited laboratory evidence, the vastness of the surveillance area, and suboptimal inter-agency coordination. This results in uneven case handling and legal proceedings taking longer than necessary. In addition, the involvement of shipping companies as business entities requires law enforcement officers to implement corporate liability mechanisms so that sanctions are not merely symbolic.

This situation underscores that the success of criminal environmental law enforcement depends not only on the availability of regulations but also on strengthening the capacity of law enforcement officers, improving integrated surveillance systems, and integrating national and international instruments. Such an approach is expected to accelerate legal processes, create a deterrent effect for offenders, minimize ecological impacts, and ensure protection for coastal communities directly affected. Therefore, this

case serves as a concrete example that environmental criminal law must function preventively, repressively, and restoratively to support the sustainability of marine ecosystems and the welfare of the community.

2. Illegal, Unreported, and Unregulated (IUU) Fishing in Sulawesi Sea (2022)

Marine pollution in Indonesia does not only arise from industrial waste and oil spills but also from illegal, unreported, and unregulated (IUU) fishing practices. Leonardo and Deeb (2022) reported that many vessels, both domestic and foreign, catch fish without proper permits and discharge waste into the sea, directly causing damage to coral reefs, reducing fish stocks, and disrupting marine ecosystems.

Based on the process flow outlined in the table, the stage of victim protection and ecosystem rehabilitation becomes critical, as coastal communities lose their livelihoods and sources of income. Criminal law enforcement against IUU fishing requires an integrative approach, involving regular maritime patrols, enforcement of criminal sanctions against offenders including businesses and corporations and programs for rehabilitating the affected ecosystems.

This approach is not only repressive but also preventive and restorative, aiming to minimize ecological and social impacts, restore marine functionality, and ensure the sustainability of fisheries resources. Furthermore, coordination across ministries and fisheries enforcement officers, including in outer sea zones, is crucial to apprehend offenders who operate across regions, ensuring that law enforcement is effective and delivers tangible benefits to both communities and marine ecosystems.

3. Industrial Waste Pollution in Cirebon (2021–2022)

Factory waste discharged into rivers that flow into the sea lowers the quality of coastal waters, damages marine ecosystems, and disrupts local fisheries productivity. According to the process flow in the table, the enforcement stage in this case involves investigation, collection and analysis of scientific evidence, and judicial proceedings. However, practical implementation still faces significant challenges, such as difficulties in proof, limited environmental laboratory facilities, and suboptimal coordination among relevant ministries, including the Ministry of Environment and Forestry and the Ministry of Marine Affairs and Fisheries.

This case demonstrates that criminal sanctions alone are insufficient to guarantee environmental protection. Environmental recovery mechanisms, rehabilitation of damaged ecosystems, and active involvement of coastal communities in supervision and monitoring are also needed. This approach not only creates a deterrent effect for offenders but also ensures ecological sustainability and justice for victims. Integration between national legal instruments, international standards, and law enforcement capacity is crucial to make enforcement strategies more effective and responsive. Therefore, handling industrial waste cases can serve as a model for holistic environmental criminal law implementation, combining repressive, preventive, and restorative aspects while increasing public awareness and participation in protecting marine ecosystems.

Based on the three cases above, it is evident that the legal enforcement flow illustrated in the table reflects real stages from regulation to victim rehabilitation. However, technical obstacles, coordination issues, and law enforcement capacity remain major factors affecting effectiveness. This underscores that marine environmental criminal law enforcement must be complemented by a restorative-ecological approach, strengthened cross-agency coordination, and integration of scientific data to support evidence collection and ecosystem recovery.

Overall, criminal law enforcement against marine pollution in Indonesia shows that successful implementation heavily relies on the integration of regulations, law enforcement officers, victim protection, and evaluation mechanisms. National and international regulations provide a strong legal framework, but effectiveness in practice is influenced by limited coordination, surveillance facilities, and complex proof procedures. Modern criminal law serves not only as a repressive tool but also plays preventive and restorative roles. Victim protection and ecosystem rehabilitation are integral parts of enforcement, ensuring environmental recovery and the sustainable welfare of coastal communities. Moreover, strengthening corporate accountability and integrating international instruments are key factors in improving compliance and preventing repeated violations.

By understanding the systematic flow of law enforcement, field obstacles, and a restorative-ecological approach, marine environmental criminal law enforcement can be designed to be more effective. Emphasizing corporate accountability, integration of national and international instruments, and environmental rehabilitation are key to achieving the ultimate legal goal: providing tangible protection for marine ecosystems and the welfare of coastal communities. Overall, these results and discussions indicate that to ensure the sustainability of Indonesia's seas, criminal law enforcement must align with the principles of sustainable development, victim protection, and effective implementation on the ground. This provides an important foundation for future policy recommendations, legal practice, and strategies for marine environmental supervision.

4. Conclusion

Criminal law enforcement against marine pollution in Indonesia is, normatively, supported by a relatively comprehensive regulatory framework. Various legislations, both national such as Law No. 32 of 2009 on Environmental Protection and Management and the 2023 National Criminal Code and international instruments like MARPOL, position criminal law as an ultimum remedium to ensure compliance while protecting the sustainability of marine environmental functions. Through the threat of criminal sanctions, the state seeks to create a deterrent effect, maintain ecosystem sustainability, and guarantee the rights of coastal communities to a clean, healthy, and productive environment. However, this study finds that the existence of comprehensive legal norms does not necessarily correlate with effective implementation in practice. Key obstacles include the complexity of evidence, the vastness of Indonesia's maritime territories, limited monitoring resources, and weak coordination among law enforcement agencies. Additionally, marine pollution crimes involving business entities or corporations require the application of a more systematic and comprehensive mechanism of criminal liability to ensure that sanctions are not merely symbolic. Empirical cases such as oil spills, industrial waste, and IUU fishing highlight the need for an integrated law enforcement approach that combines legal norms, law enforcement officers, and environmental restoration.

Modern criminal law approaches are not only oriented toward a repressive effect to punish offenders but must also be preventive and restorative. Law enforcement should promote the rehabilitation of damaged ecosystems, provide compensation and protection for coastal communities, and integrate the principles of green victimology as part of environmental protection strategies. Strengthening the capacity of law enforcement institutions, harmonizing sectoral regulations, enhancing monitoring, integrating international instruments, and enforcing corporate liability are crucial steps to ensure that environmental legal objectives are achieved effectively and sustainably.

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