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HOW CAN LEGAL POLITICS ADVANCE ENVIRONMENTAL JUSTICE? A CASE STUDY OF ILLEGAL SEA SAND MINING IN BABI ISLAND, KARIMUN, RIAU ISLANDS

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ABSTRACT

Illegal sea sand mining poses significant challenges to environmental justice, particularly in Indonesia's coastal regions. This research is motivated by the urgency to understand and evaluate legal policies to address the complexities of issues arising from sea sand mining activities. The study explores how environmental legal policies are applied to regulate and mitigate the impacts of illegal sea sand mining. Additionally, it examines the consequences of illegal mining on environmental justice, particularly concerning coastal ecosystem degradation and the livelihoods of local communities. Despite the existence of regulatory instruments such as Government Regulation No. 26 of 2023 on Marine Sedimentation Management and Law No. 32 of 2009 on Environmental Protection and Management, enforcement remains inadequate, allowing persistent violations that exacerbate ecological damage and social inequities. This study employs a normative legal method with a statutory and case study approach, analyzing secondary data from legal documents, academic literature, and media reports. Thematic, policy, and case analyses reveal significant implementation gaps, weak enforcement mechanisms, and insufficient community participation in environmental governance. The findings indicate that while existing legal frameworks provide a foundation for sustainable resource management, systemic weaknesses and fragmented governance hinder their effectiveness in preventing illegal activities. This research recommends strengthening regulatory enforcement, enhancing community empowerment through environmental education, and integrating sustainability principles into policy implementation. Additionally, fostering multi-stakeholder collaboration is crucial for addressing governance challenges and ensuring the equitable distribution of environmental benefits and risks. These strategies aim to promote environmental justice and sustainable coastal management in Indonesia.
Keyword: Environmental Justice, Illegal Sea Sand Mining, Coastal Ecosystems, Legal Politic, Sustainable Governance

ABSTRAK

Penambangan pasir laut ilegal menimbulkan tantangan besar terhadap keadilan lingkungan, khususnya di wilayah pesisir Indonesia. Penelitian ini didorong oleh urgensi untuk memahami dan mengevaluasi kebijakan hukum dalam menangani kompleksitas permasalahan yang timbul akibat aktivitas tambang pasir laut ilegal. Studi ini menganalisis bagaimana kebijakan hukum lingkungan diterapkan dalam mengatur dan mengurangi dampak penambangan pasir laut ilegal. Selain itu, penelitian ini juga mengkaji konsekuensi dari praktik penambangan ilegal terhadap keadilan lingkungan, terutama terkait degradasi ekosistem pesisir dan mata pencaharian masyarakat setempat. Meskipun telah terdapat instrumen regulasi seperti Peraturan Pemerintah Nomor 26 Tahun 2023 tentang Pengelolaan Sedimentasi Laut dan Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup, lemahnya penegakan hukum memungkinkan terjadinya pelanggaran yang berulang, sehingga memperburuk kerusakan ekologis dan ketimpangan sosial. Penelitian ini menggunakan metode

hukum normatif dengan pendekatan perundang-undangan dan studi kasus, menganalisis data sekunder dari dokumen hukum, literatur akademik, dan laporan media. Analisis tematik, kebijakan, dan studi kasus mengungkap adanya kesenjangan implementasi yang signifikan, lemahnya mekanisme penegakan hukum, serta minimnya partisipasi masyarakat dalam tata kelola lingkungan. Berdasarkan temuan ini, penelitian merekomendasikan penguatan penegakan regulasi, peningkatan pemberdayaan masyarakat melalui pendidikan lingkungan, serta integrasi prinsip keberlanjutan dalam implementasi kebijakan. Selain itu, kolaborasi multi-pemangku kepentingan menjadi elemen kunci dalam mengatasi tantangan tata kelola dan memastikan distribusi manfaat serta risiko lingkungan yang lebih adil. Strategi ini bertujuan untuk mewujudkan keadilan lingkungan serta pengelolaan pesisir yang berkelanjutan di Indonesia.
Kata Kunci: Keadilan Lingkungan, Penambangan Pasir Laut Ilegal, Ekosistem Pesisir, Politik Hukum, Tata Kelola Berkelanjutan

1. Introduction

Indonesia possesses vast coastal and marine territories rich in natural resources, including oil and gas, minerals, fisheries, coral reefs, mangroves, and beach sands (Pane et al., 2021). However, these abundant resources are often exploited unsustainably, threatening the integrity of coastal ecosystems (Sitorus, 2019). Among the most destructive activities are sea sand mining and coastal reclamation, which lead to beach erosion, reduced fish productivity, flooding, and the loss of small islands (Ilmar et al., 2024). Exploitation is frequently conducted without regard for the importance of maintaining ecological stability, as environmental degradation is often viewed as a necessary consequence of economic pursuits.

Historically, sea sand mining in Indonesia has been conducted for decades, particularly in the Riau Archipelago (Sollitan et al., 2019). The demand for sea sand, primarily driven by reclamation projects in neighboring countries such as Singapore, has escalated over time. However, this activity has caused severe environmental damage, including coastal abrasion, coral reef destruction, and habitat loss for marine species (Nurdin et al., 2024). These environmental changes have directly impacted the livelihoods of coastal communities, particularly fishers who depend on marine resources for their subsistence.

As a non-metallic mining sector, sea sand mining has a finite lifecycle (Martínez-Alier, 2023). Beyond depleting mineral reserves, it creates significant challenges during post-mining phases, necessitating careful planning to ensure environmental sustainability and the well-being of affected communities (Everingham et al., 2022). In this context, integrating sustainability into sea sand mining management has become a critical imperative in Indonesia (Jamika et al., 2023).

To address the adverse effects of sea sand mining, the Indonesian government has enacted various regulations, including Law No. 32 of 2009 on Environmental Protection and Management (Sood, 2021). This regulation aims to provide legal certainty for environmental protection, impose sanctions on violators, and promote sustainability principles in economic activities within coastal areas. However, despite these legislative efforts, many coastal regions continue to suffer severe environmental damage due to weak policy implementation.

Over time, marine resource management policies have undergone significant changes. In 2003, the government banned sea sand exports through Ministerial Decree No. 117/MPP/Kep/2/2003, supported by Presidential Instruction No. 2 of 2002 and Presidential Decree No. 33 of 2002 (Kornelius, 2024). This ban responded to escalating concerns about widespread coastal damage. However, in May 2023, the issuance of Government Regulation No. 26 of 2023 on the Management of Marine Sedimentation (henceforth referred to as GR 26/2023) officially reopened sea sand mining activities, allowing the utilization of marine sedimentation for reclamation, infrastructure development, and export purposes (Fajar, 2024). This policy marked the end of a two-decade moratorium, presenting new challenges for ensuring the sustainability of marine resource management.

This shift highlights the complexity of the social and economic impacts of sea sand mining activities. On the one hand, as a country with the second-longest coastline in the world—approximately 61,000 km—Indonesia has positioned the maritime sector as a cornerstone of national development (Jamika et al., 2023).

On the other hand, the country faces significant challenges in balancing economic utilization and marine ecosystem protection (Hasan & SH, 2021).

Weak oversight of mining permits and a lack of sustainability-oriented policy implementation remain significant barriers to preserving coastal environments (Kabes, n.d.). A holistic approach involving law enforcement, sustainability-based resource management, and increased awareness of marine and coastal ecosystem preservation is urgently needed. Furthermore, the lack of public awareness about ecological preservation exacerbates the problem, as some community members prioritize economic benefits over environmental consequences.

A notable example of this issue is the illegal sea sand mining case in Babi island, Karimun Regency, Riau Islands Province. In June 2024, the Indonesian Maritime Security Agency (Bakamla) intercepted three vessels belonging to the Rezeki Anak Melayu (RAM) group, suspected of conducting unauthorized mining activities as stipulated under GR 26/2023 (Wiyoga, 2024). Investigations revealed the falsification of Marine Space Utilization Suitability Approval (PKKPRL) documents, a primary requirement for conducting sea sand mining activities. This case underscores weak oversight and inadequate enforcement of laws governing marine resource management in Indonesia (Hamapu, n.d.).

This specific incident, involving the illegal activities near Babi island, was further documented through radar data obtained by KN Bintang Laut-401, pinpointing the vessel's location at 00°58’ 315” N – 103°22 ‘464” E at 08:30 WIB. Babi island itself is situated in Karimun Regency, Riau Islands Province, as illustrated in the following map location below (Figure 1):

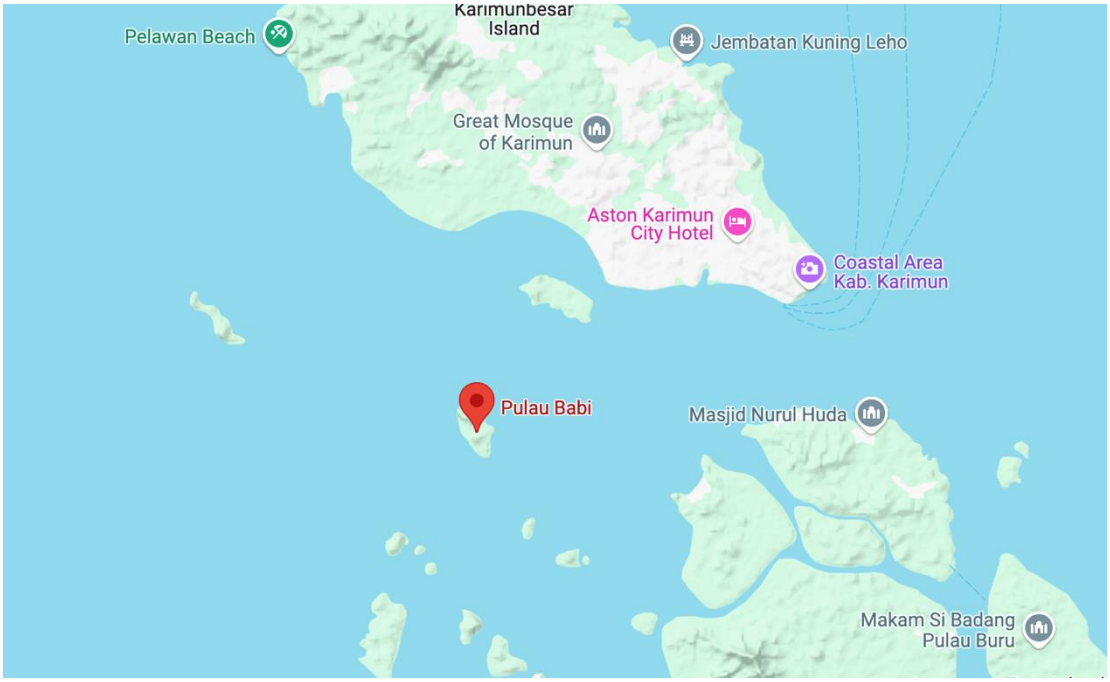

Figure 1. Map of Babi Island, Karimun Regency, Riau Islands Province
Source: Google Maps

This research is motivated by the urgency to understand and evaluate the effectiveness of environmental legal policies in addressing the complexities of issues arising from sea sand mining activities. In the Indonesian context, sea sand mining is not merely a matter of resource exploitation but also involves protecting the rights of affected coastal communities, preserving ecosystems, and enforcing equitable laws. Given the wide-ranging environmental and social impacts, this study aims to contribute by examining the practical application of environmental policies and evaluating whether the existing legal frameworks are sufficiently adaptive to address the dynamic challenges on the ground.

The illegal extraction of sea sand poses significant environmental and socioeconomic challenges on a global scale. Sand mining activities, often exceeding natural replenishment rates, disrupt ecological balance, harm coastal flora and fauna, and weaken natural barriers against climate change-induced sea-level rise (Leal

Filho et al., 2021). In Indonesia, despite a robust legal framework, including laws like Law Number 32 of 2009, enforcement remains inconsistent due to corruption within the mining sector and leniency by regional authorities towards companies violating environmental standards (Tegnan et al., 2021). These gaps in governance have allowed the persistence of unsustainable mining practices, exacerbating environmental degradation and threatening livelihoods dependent on marine ecosystems.

Globally, the implications of sand mining extend beyond ecological impacts. For instance, it disrupts fisheries in Cambodia, compromises riverbank agriculture in Myanmar, and exploits migrant labor in Singapore, highlighting the interconnected socioeconomic ramifications of the sand trade (Lamb et al., 2019). Such evidence underscores the urgent need for an ecological justice framework within mining governance. Rohman et al. (2024) suggest that improving administrative enforcement mechanisms, particularly in designated mining business areas, could enhance environmental compliance and accountability. Strengthening law enforcement, monitoring systems, and fostering international collaboration have been identified as critical strategies to mitigate the unsustainable extraction of sand resources (Leal Filho et al., 2021).

In addressing these systemic issues, the concept of marine justice emphasizes the importance of shifting cultural values and adopting participatory governance approaches to tackle vulnerabilities created by extractive practices (Reid, 2023). Furthermore, public interest litigation has emerged as a potential tool to counter marine environmental pollution, yet its effectiveness is constrained by legal frameworks that prioritize private property rights over collective environmental rights (Li, 2022). These limitations call for transformative legal reforms that balance economic interests with ecological sustainability and social equity.

A critical research gap exists in understanding how local communities can effectively engage with and influence existing legal frameworks to ensure environmental justice, particularly in regions experiencing rampant illegal sand mining. Hallgren and Hansson (2021) argue that more inclusive and participatory governance models are necessary to integrate local voices into decision-making processes surrounding marine resource exploitation. This gap is particularly relevant to the Indonesian context, where the socio-ecological impacts of illegal sea sand mining, such as those in Babi island, require urgent attention.

Building on the existing literature, this study focuses on two primary research questions: *First,* How is environmental legal policy applied in addressing sea sand mining, particularly illegal sand mining, in Indonesia? *Second,* what are the impacts of illegal sea sand mining on environmental justice, particularly concerning the degradation of coastal ecosystems and the livelihoods of local communities? The first research question explores the role of environmental legal policy as a reflection of state governance in balancing economic, environmental, and social needs. It investigates the practical implementation of laws like Peraturan Pemerintah Nomor 26 Tahun 2023, examining whether they effectively prevent environmental degradation and ensure sustainable resource management. The second question addresses the socio-ecological consequences of illegal sand mining, which disrupt marine ecosystems and exacerbate social inequities. The livelihoods of local communities, particularly fishers and small-scale coastal inhabitants, are directly impacted by reduced marine biodiversity and the loss of critical habitats.

The gap in previous studies lies in the limited understanding of how local stakeholders can participate in the governance processes to mitigate the environmental and social impacts of illegal mining. This research seeks to fill that gap by proposing a governance framework that incorporates local community engagement, robust enforcement mechanisms, and sustainable resource management principles. By addressing these research questions, this study contributes to a deeper understanding of the interplay between legal politics, environmental justice, and sustainable governance in Indonesia's coastal and marine resource management. It aims to provide actionable recommendations for policymakers to align national economic goals with the protection of vulnerable ecosystems and the rights of marginalized coastal communities.

2. Method

This study employs a normative legal research methodology with a legislative approach, complemented by a case study method to provide a comprehensive understanding of illegal sea sand mining activities and their impacts on environmental justice. By focusing on the case of Babi island, Karimun Regency, this research seeks to evaluate the effectiveness of Indonesia’s legal frameworks, particularly in

addressing ecological degradation and social inequities caused by illegal mining practices.

2.1 Research Design

The normative approach is chosen to analyze the regulatory dimensions of illegal sea sand mining, using laws, regulations, and policy documents as primary sources. The study incorporates a qualitative case study method, which allows an in-depth exploration of specific environmental, social, and governance phenomena. Through this design, the research aims to identify implementation gaps in existing policies and evaluate their socio-ecological implications, integrating descriptive and exploratory elements for a multidimensional analysis.

2.2 Data Collection

The study relies on secondary data as the primary source of information, ensuring the robustness and relevance of findings. The key categories of secondary data include:

- Policy and Legal Documents. Analysis of key regulatory frameworks such as Peraturan Pemerintah Nomor 26 Tahun 2023 and Undang-Undang Nomor 32 Tahun 2009, as well as related national and local regulations governing sea sand mining and environmental protection.
- Academic Literature. Review of scholarly works addressing themes like environmental justice, coastal ecosystem degradation, and governance challenges in natural resource management. Studies such as Fitriawan et al. (2021) provide critical insights into sustainability and policy implementation.
- Media Reports. Compilation of investigative journalism articles and news reports to contextualize the scale, scope, and impact of illegal sea sand mining activities, with specific reference to the Babi island case.

2.3 Data Analysis

The research employs multiple analytical techniques to provide a comprehensive examination of the issue:

- Thematic Analysis. This approach is used to identify recurring patterns and themes within the collected data. Key aspects analyzed include the socio-economic impacts on local communities, ecological degradation caused by illegal mining, and challenges in enforcing regulatory frameworks.
- Policy Analysis. A critical evaluation of existing laws and regulations is conducted to assess their adequacy and effectiveness. This includes a detailed review of Peraturan Pemerintah Nomor 26 Tahun 2023 to determine its alignment with sustainability principles and its ability to address illegal sand mining practices.
- Case Analysis. A focused analysis of the Babi island case highlights the practical challenges and systemic failures in managing illegal sea sand mining. By examining specific events, such as the documented involvement of vessels like KM Cinta Damai and KM Nurul Yakin in unauthorized mining activities, the study illustrates the broader implications for policy and governance.

3. Result and Discussion

This section presents the research findings and analyzes them within the framework of the research conceptual framework. The results of this study answer the research problems by looking at the chronology of illegal sea sand mining on Babi Island, the implementation of environmental law policies, and the socio-environmental impacts of these activities on environmental justice. However, previously, the conceptual framework of this paper will be presented in Table 1 below:

Table 1. Conceptual Framework

Core Element	Sub-elements	Relationships/Impacts
Illegal Sea Sand	- Unsustainable extraction rates - Unauthorized activities	Leads to environmental degradation

Mining	- Weak enforcement	and social inequities.
Environmental Degradation	- Coastal erosion - Coral reef damage - Habitat loss - Declining fish populations	Directly impacts local livelihoods and marine biodiversity, undermining ecological balance.
Social Inequities	- Displacement of local communities - Reduced income for fishers - Inequitable resource use	Amplifies vulnerabilities among marginalized coastal populations, worsening economic disparities.
Legal Framework	- PP No. 26/2023 - UU No. 32/2009 - Regional regulations	Provides regulatory tools but faces implementation gaps due to corruption and weak oversight.
Governance Challenges	- Inefficient enforcement - Lack of inter-agency coordination - Limited community participation	Hinders effective management of resources and compliance with sustainability goals.
Sustainability Principles	- Resource management - Ecological restoration - Community engagement	Aims to balance economic development with environmental protection and equitable governance.
Policy Recommendations	- Strengthen law enforcement - Enhance community empowerment - Promote multi-stakeholder collaboration	Seeks to align legal frameworks with sustainable practices and ensure justice for affected communities.

Source: created by author.

3.1 Chronology of the Case

The history of marine sand mining in the Riau Archipelago, particularly around Babi island, Karimun Regency, highlights longstanding tensions between economic interests and environmental sustainability. From 1976 to 2002, large-scale sand extraction was driven by Singapore's demand for land reclamation materials. While the operations generated significant economic benefits, they caused extensive environmental degradation, including severe coastal erosion, destruction of coral reefs, loss of fish habitats, and diminished fishing yields, affecting local communities' livelihoods (Rahmad, 2018; Sofiyani et al., 2012). Despite the official cessation of marine sand mining in 2002, the ecological impacts remain unresolved, leaving a legacy of environmental and socio-economic harm.

In 2024, illegal sand mining activities resurfaced as a critical issue when unauthorized operations were detected near Babi island, a zone designated as off-limits for mining. On June 28, 2024, a surveillance operation by the KN Bintang Laut-401, under Bakamla, identified and intercepted three vessels—KM Nurul Yakin Baru (a dredging vessel), KM HARY (a transport vessel), and KM Cinta Damai (another transport vessel, partially loaded with 30 tons of sand). These vessels, owned by the group Rezeki Anak Melayu (RAM), lacked the required Persetujuan Kesesuaian Kegiatan Pemanfaatan Ruang Laut (PKKPRL), a key permit mandated by Government Regulation No. 26 of 2023. RAM claimed to hold a valid Izin Pertambangan Rakyat (IPR), but the absence of PKKPRL rendered their operations unlawful (Hamapu, n.d.; Kasim, 2024).

Further investigations unveiled evidence of document forgery in RAM's PKKPRL application submitted in March 2024. This discovery led the Ministry of Maritime Affairs and Fisheries (KKP) to escalate the case to the Riau Islands Regional Police, demonstrating the intertwining of environmental violations with broader governance and enforcement challenges. The incident highlights systemic weaknesses in monitoring and regulating marine resource exploitation (Hamapu, n.d.; Kasim, 2024).

The illegal marine sand mining at Babi island exacerbates ongoing environmental crises in the region. Coral reefs—vital ecosystems for marine biodiversity—have suffered extensive damage, and coastal erosion

has intensified, threatening the structural integrity of small islands. For local communities reliant on fishing, the destruction of fish habitats has led to longer trips to find viable fishing grounds, raising operational costs and reducing their income. As Amirullah (59), a local fisherman, noted, the depletion of nearby marine resources has significantly diminished their economic stability and quality of life (Wiyoga, 2024). These consequences underscore the disproportionate burden borne by marginalized coastal populations, reflecting a broader pattern of environmental injustice.

The response to this case involves multiple agencies, including Bakamla, KKP, the Fisheries Resource Surveillance Agency (PSDKP), and local governments. While Bakamla has prioritized administrative sanctions, the severity of the violations may warrant criminal charges. Coordinating enforcement efforts, however, has proven challenging, with delays attributed to the verification of documentation and inter-agency collaboration. For instance, Bakamla's plan to transfer custody of the detained vessels to PSDKP hinges on completing necessary administrative checks, highlighting procedural inefficiencies (Kasim, 2024).

This fragmented approach underscores broader weaknesses in Indonesia's governance framework for marine resource management. Despite robust legal provisions such as Government Regulation No. 26 of 2023, gaps in enforcement, coupled with a lack of transparency and accountability, enable violations like those at Babi island to persist.

The Babi island case reflects deeper systemic issues within Indonesia's environmental governance and political-legal landscape. Although the regulatory framework has evolved to address marine resource management, its effectiveness is undermined by weak institutional capacity, insufficient monitoring, and corruption. The forgery of PKKPRL documents in this case highlights vulnerabilities in the permitting process, necessitating stricter oversight and digitalization of permit systems to reduce opportunities for manipulation.

From a political-legal perspective, the case exemplifies the challenge of balancing economic development with environmental preservation. The prioritization of short-term economic gains, often driven by vested interests, conflicts with the principles of sustainable development enshrined in Indonesia's Constitution and environmental laws. Strengthening inter-agency coordination, increasing transparency in resource management, and enhancing community participation in decision-making are critical steps toward achieving environmental justice.

Addressing the socio-economic impacts of illegal activities on vulnerable coastal communities also requires targeted interventions, such as livelihood diversification programs and financial assistance to mitigate income losses. These measures, coupled with stricter enforcement of legal frameworks, can help bridge the gap between economic imperatives and environmental sustainability, ensuring that cases like Babi island do not recur.

Simply put, the above chronology can be seen in Table 2 below:

Table 2. Chronology of the Illegal Marine Sand Mining Case at Babi island, Karimun Regency

Aspect	Details
Background	Marine sand mining activities in the Riau Islands were officially stopped in 2002, but the environmental and socio-economic impacts persist.
Arrest	Bakamla intercepted three vessels owned by RAM near Babi island on June 28, 2024.
Permitting Issue	RAM held an IPR (Small-Scale Mining License) but lacked a PKKPRL, violating Government Regulation No. 26 of 2023.
Alleged Forgery	RAM's submitted PKKPRL documents were suspected to be forged, prompting a report to the Riau Islands Regional Police.
Environmental Impact	Coral reef destruction, island erosion, and loss of fish habitats.
Social Impact	Fishermen faced declining fish stocks, were forced to venture farther for fishing, and experienced reduced incomes.
Institutional Response	The case involves coordination among Bakamla, KKP, PSDKP, and local governments, focusing on both administrative sanctions and criminal charges.

Source: Processed by the author.

The illegal marine sand mining case at Babi island illustrates the challenges in enforcing environmental law and governance in Indonesia. Effective inter-agency coordination, stricter permit oversight,

and rigorous sanctions are essential to address this issue. Furthermore, prioritizing marine ecosystem protection is critical to balancing economic needs with environmental sustainability.

3.2 Environmental Legal Policy in Addressing Illegal Sea Sand Mining

Environmental law and policy serve as normative frameworks guiding state actions to integrate environmental sustainability with societal economic and social needs (Maulidyna, 2022). This balance becomes crucial in the context of marine sand mining, an activity that poses threats not only to environmental sustainability but also to the socio-economic stability of coastal communities. A concrete example is the illegal marine sand mining case at Babi island, Karimun Regency, which highlights significant challenges in implementing effective environmental policies.

Marine sand mining and export have long been contentious. Studies by *National Geographic* and environmental NGOs reveal that Singapore imported around 300 million cubic meters of marine sand from Indonesia for land reclamation. Recognizing the adverse impacts—particularly the threats to small island sustainability—the Indonesian government, under President Megawati Soekarnoputri, enacted a ban on marine sand exports.

The legal basis for such measures was solidified through Law No. 32 of 2009 on Environmental Protection and Management (UU PPLH), which emphasizes the importance of environmental permits as administrative instruments to control activities with potential environmental risks. This principle aligns with earlier provisions in Law No. 23 of 1997, which also mandated permits as legal prerequisites for certain economic activities (Pambudhi & Ramadayanti, 2021). These permits are intended not only to ensure regulatory compliance but also to provide a framework for environmental protection.

However, the landscape shifted with the enactment of Government Regulation No. 26 of 2023, which marked a significant policy change in managing marine sedimentation. The regulation reopened opportunities for utilizing marine sand for reclamation, infrastructure, and export, provided domestic needs are met. Key provisions of PP No. 26/2023 are summarized in Table 3 below:

Table 3. Important Articles and Aspects in Government Regulation 26 Year 2023

Article	Key Aspects
Marine Sand Utilization (Art. 9 (1) & (2))	Regulates the use of sedimented marine sand for reclamation, infrastructure, and export, contingent upon domestic demand being satisfied.
Community and Environmental Protection (Art. 11)	Mandates that businesses protect the environment, engage local communities, and ensure access to marine resources.
Permits and Evaluation (Art. 16)	Requires comprehensive proposals, including environmental impact assessments (EIA), mitigation plans, and financial studies, evaluated by relevant government teams before issuance.
Monitoring and Accountability (Art. 21 (1))	Obligates regular reporting on operational locations, methods, impacts, and financial responsibilities.

Source: Processed by the author.

While these provisions are designed to ensure environmental sustainability and local community engagement, they also introduce new challenges. The reopening of exploitation raises risks of illegal practices, particularly where monitoring is weak. Additionally, the complexity of administrative requirements, such as periodic reporting and financial obligations, is often disregarded by non-compliant businesses (Keohane et al., 2019).

The illegal marine sand mining case at Babi island exemplifies regulatory enforcement challenges. In 2024, the Indonesian Maritime Security Agency (Bakamla) discovered that three Indonesian-flagged vessels transported marine sand without valid permits. Forged documents for the Marine Spatial Utilization Approval (PKKPRL) further revealed administrative oversight weaknesses and insufficient deterrence from existing sanctions.

Investigations indicated that vessels, including the *KM Cinta Damai*, transported up to 30 tons of illegal marine sand, violating their permit limits. This non-compliance underscores gaps in the permitting

process and the enforcement of key provisions, such as Article 16, which mandates environmental impact assessments and mitigation plans.

The success of environmental law and policy in managing illegal marine sand mining hinges on consistent implementation and effective enforcement. Sustainable governance requires stringent oversight of permitting processes and accountability mechanisms, including post-mining environmental restoration (Takalapeta et al., 2019). Such governance must involve collaboration among the government, businesses, and communities to balance economic exploitation with environmental preservation.

Theories of environmental governance emphasize the importance of multisectoral integration, positioning the government as a primary regulator, communities as participatory watchdogs, and businesses as responsible economic actors (Bodin, 2017). This collaborative approach is essential to addressing complex issues, including ecosystem degradation and social inequality caused by marine sand mining (Li et al., 2024).

Non-compliance with regulations undermines principles of good governance and leads to significant environmental damage. Coastal ecosystem degradation from illegal marine sand mining includes beach erosion, habitat loss, and declining fisheries productivity. Long-term impacts threaten the economic resilience of coastal communities reliant on marine resources.

The policy shift under PP No. 26/2023, which permits the exploitation of sedimented marine sand, risks amplifying illegal practices if monitoring mechanisms are not robust. Case studies reveal that marine sand utilization often occurs outside designated areas, as evidenced by discrepancies in permits issued by the Riau Islands Governor and the Ministry of Marine Affairs and Fisheries. These issues point to inadequate interagency coordination and weak law enforcement.

These challenges—marked by inadequate interagency coordination and weak enforcement—are not isolated but rather symptomatic of broader external dynamics encompassing political, economic, social, technological, legal, and environmental factors that shape the efficacy of environmental legal policy. The following PESTLE analysis (Table 4) offers a comprehensive examination of these external factors to illuminate the root causes of policy implementation gaps and their cascading effects below:

Table 4. PESTLE Analysis of Environmental Legal Policy on Illegal Sea Sand Mining

Factor	Key Considerations	Implications
Political	Lack of political will to enforce environmental regulations; potential conflicts of interest in permitting processes	Weak law enforcement allows illegal activities to persist; undermines public trust in government institutions.
Economic	High demand for sea sand in construction and land reclamation; illegal mining offers low-cost alternatives	Creates economic incentives for illegal exploitation; disregards environmental costs and exacerbates social inequalities for local communities.
Social	Displacement of coastal communities; loss of traditional livelihoods; health risks from degraded water quality	Social injustices intensify as vulnerable groups bear disproportionate environmental and economic burdens; rising tensions between communities and government.
Technological	Limited adoption of monitoring tools (e.g., satellite imagery, drones); outdated enforcement technologies	Inefficient detection and prevention of illegal mining activities; hinders transparency and accountability in environmental governance.
Legal	Ineffective implementation of regulatory frameworks like PP 26/2023; lack of judicial capacity and frequent procedural corruption	Regulatory gaps allow illegal mining to flourish; weak legal repercussions fail to deter offenders.
Environmental	Ecosystem degradation (e.g., erosion, coral reef damage); cumulative impacts on marine biodiversity and coastal resilience	Accelerates environmental injustices; diminishes long-term sustainability and resilience of coastal areas.

Source: Processed by the author.

3.3 The Impacts of Illegal Sea Sand Mining on Environmental Justice

Illegal sea sand mining significantly undermines environmental justice through the degradation of coastal ecosystems. This activity often triggers coastal erosion, coral reef destruction, habitat loss for marine species, and a decline in fishery productivity (Rangel-Buitrago et al., 2023). These consequences stem from

exploitative practices that disregard ecological balance, coupled with inadequate mitigation measures. The mining process generates waste that pollutes marine waters, increases turbidity, and jeopardizes marine biodiversity. Persistent ecological stress on coastal ecosystems, such as altered beach morphology, serves as a key indicator of these adverse effects.

This ecosystem degradation extends beyond environmental concerns, profoundly impacting local communities reliant on marine resources for their livelihoods. Traditional fishers, for example, face diminished fish catches due to the environmental degradation, forcing them to seek alternative livelihoods in precarious informal sectors (Fuaddah, 2024). Such economic shifts often exacerbate the vulnerability of these communities, who bear the brunt of environmental and socioeconomic disruptions.

Studies have shown that unchecked sea sand mining exacerbates the vulnerability of coastal communities. In Indonesia, illegal sea sand mining has resulted in severe environmental and socioeconomic repercussions, including mangrove ecosystem degradation, coastal erosion, and marine pollution (Surianti et al., 2023). These environmental changes have led to reduced fish catches and declining incomes for traditional fishers, compelling many to pursue alternative livelihoods or join larger-scale fishing operations (Anggariani et al., 2021).

From the perspective of environmental justice, illegal sea sand mining exacerbates social and environmental disparities. The economic benefits of these activities are typically concentrated among a select group of entrepreneurs and economic actors involved in the supply chain, while the ecological and social costs are borne by vulnerable coastal communities. This inequity is further aggravated by low environmental literacy among local populations and limited access to legal recourse (Chancel, 2020).

Environmental justice demands an equitable distribution of benefits and risks among stakeholders (Menton et al., 2020). In the case of Babi island, stark social disparities highlight this injustice. While financial profits from illegal mining—such as proceeds from sea sand sales—are enjoyed by mining operators, ship owners, and corporations, ecological losses, including mangrove destruction and reduced fish yields, are disproportionately borne by the local community. Economically and politically marginalized, the Babi island community faces substantial barriers to securing adequate legal and environmental protections.

Weak enforcement of environmental laws exacerbates the issue, creating a permissive environment for illegal mining activities. For instance, despite violations being identified in Babi island, the sanctions imposed have often lacked deterrent effect. This aligns with research indicating that Indonesia's environmental regulatory framework remains permissive toward violations, allowing irresponsible exploitation of natural resources to persist (Wiratraman, 2022; Wahyudi et al., 2024).

For example, three vessels violating Article 16A in conjunction with Article 16 Paragraph (2) of Law No. 6 of 2023 on the Establishment of the Job Creation Law, as well as Article 23 Paragraph (1) in conjunction with Article 10 Paragraph (1) of Government Regulation No. 26 of 2023 on Sedimentation Management at Sea, highlighted critical weaknesses in enforcement mechanisms. Document forgery, such as falsifying Sea Spatial Utilization Activity Approval (PKKPRL) documents, exemplifies systemic vulnerabilities that facilitate irresponsible resource exploitation.

These issues are not merely operational but indicative of deeper strategic and structural gaps in legal policy. The following SWOT analysis (Table 5) provides a structured evaluation of the strengths, weaknesses, opportunities, and threats within the current policy landscape, offering insights into its operational and strategic deficiencies.

Table 5. SWOT Analysis of Legal Policy in Tackling Illegal Sea Sand Mining

Category	Strengths	Weaknesses	Opportunities	Threats
Policy	Established regulatory frameworks like PP 26/2023; international commitments to environmental protection	Poor implementation and enforcement; reliance on reactive rather than preventive measures	Strengthening compliance mechanisms through community participation and technological tools	Persistent corruption and fraud in licensing; political interference in enforcement

Environmental	Acknowledgment of ecosystem vulnerabilities in legal texts	Limited integration of ecosystem-based management approaches	Restoration programs (e.g., mangroves, coral reefs) could enhance biodiversity and local livelihoods	Accelerating climate change exacerbates existing vulnerabilities
Social	Growing public awareness about environmental justice	Marginalization of local communities in decision-making processes	Collaborative initiatives could empower coastal communities and improve trust in governance	Social resistance and conflict may escalate if communities are excluded from reforms
Economic	Recognition of the economic potential of sustainable marine resource management	Short-term economic incentives for illegal mining overshadow long-term sustainability goals	Transition to sustainable resource use could create new economic opportunities (e.g., eco-tourism, green technologies)	Economic dependence on sand exports; global demand pressures

Source: Processed by the author.

The insights derived from the SWOT analysis underscore the need for targeted interventions to address the multifaceted challenges of illegal sea sand mining. Additionally, to address environmental injustice resulting from illicit sand sea mining, comprehensive and sustainable strategies are imperative (Figure 2):

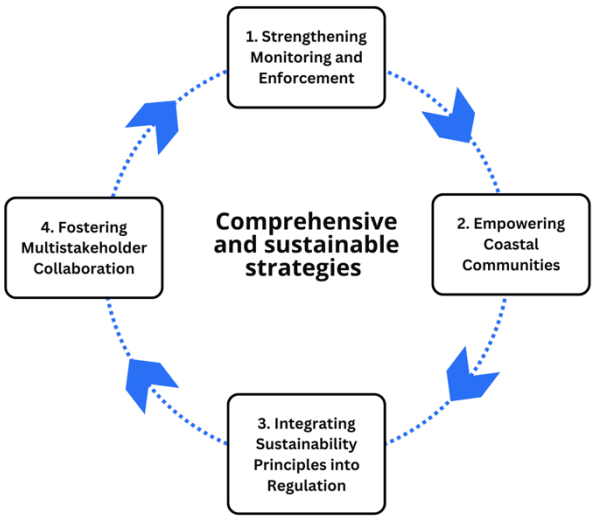

Figure 2. Comprehensive and sustainable strategies

1. Strengthening Monitoring and Enforcement.
   Governments must enhance oversight capacity by integrating advanced monitoring technologies and conducting more effective field inspections. Consistent and stringent sanctions are necessary to deter violations.
2. Empowering Coastal Communities.
   Environmental education initiatives targeting coastal communities can raise awareness about the importance of preserving marine ecosystems. Furthermore, involving local communities in decision-making processes and monitoring mining activities can reinforce environmental justice.
3. Integrating Sustainability Principles into Regulation.

Legal frameworks, such as Government Regulation No. 26 of 2023, must be strictly enforced to ensure compliance with sustainability principles. Approvals for sea sand utilization should mandate comprehensive environmental impact assessments and local community involvement.

4. Fostering Multistakeholder Collaboration.
   Collaborative approaches involving governments, businesses, academics, and communities are essential to ensuring transparent and accountable governance. These collaborations should focus on mitigating environmental impacts and safeguarding local communities' rights.

Environmental legal policies in Indonesia play a crucial role in addressing illegal sea sand mining but face significant implementation challenges, particularly in law enforcement and oversight. The detrimental impacts of illegal sea sand mining underscore the prevalence of environmental injustice, driven by uncontrolled ecosystem degradation and disparities in benefit and risk distribution. Strengthening legal frameworks, enhancing oversight, and empowering local communities are pivotal to ensuring environmental justice and sustaining coastal ecosystems.

4. Conclusion

The practice of illegal sea sand mining in Babi island, Karimun Regency, epitomizes the critical challenges inherent in Indonesia's environmental legal and policy frameworks. Ecosystem degradation, including coastal erosion, coral reef destruction, and water quality deterioration, exacerbates environmental injustices, with local communities disproportionately bearing the ecological and socio-economic burdens while receiving negligible economic benefits. This disparity underscores the inadequate legal protection for vulnerable coastal populations.

Although regulatory frameworks, such as Government Regulation No. 26 of 2023, aim to address these issues, their implementation remains suboptimal. Weak monitoring systems, inconsistent law enforcement, and fraudulent licensing practices undermine the effectiveness of environmental governance. These shortcomings reveal that environmental legal policies have yet to strike a balance between economic interests, environmental sustainability, and social equity. Reforming policy with an emphasis on transparency, collaboration, and robust enforcement is crucial to achieving fair and sustainable marine resource management.

This study acknowledges certain limitations. Firstly, the analysis primarily relies on secondary data, which might not capture the nuances of local community experiences and the full extent of ecological damage. Additionally, the focus on legal and regulatory aspects may have excluded other relevant dimensions, such as cultural practices and local wisdom, that could influence sustainable resource management. Lastly, the geographical scope was limited to Babi island, potentially restricting the generalizability of findings to other regions experiencing similar issues.

Future studies should consider adopting a mixed-methods approach that incorporates extensive fieldwork and qualitative data to explore the lived experiences of affected communities. Comparative analyses of similar cases across different regions would provide broader insights into systemic issues and potential solutions. Moreover, further research could delve into the role of indigenous knowledge in mitigating the impacts of illegal mining and promoting sustainable practices. Investigating the effectiveness of technology-driven monitoring systems and their integration into policy frameworks would also be beneficial for enhancing law enforcement capabilities.

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