

Sustainable Coastal Governance and Legal Accountability for Damage to Public Facilities in Indonesia

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ABSTRACT

This study aims to analyze the effectiveness of coastal governance laws in preventing and addressing damage to public infrastructure and formulate the necessary legal reforms to align coastal infrastructure protection with sustainable development goals. The damage to public facilities in coastal areas, such as embankments, coastal roads, people's ports, and flood control systems is increasing due to development pressures, changes in spatial planning, and the impact of climate change. Although Indonesia already has a relatively comprehensive regulatory framework in the management of coastal areas, the environment, and spatial planning, there is still a gap between legal norms and the effectiveness of their implementation in preventing damage to public infrastructure. This study uses normative legal research methods with legislative, conceptual, and comparative approaches. The analysis is carried out based on the Theory of the State of Law to assess the effectiveness of applicable regulations, as well as the Theory of Sustainable Development to formulate the direction of legal reform. The results of the study show that normatively coastal governance laws have met the principles of legality and attribution of authority, but their effectiveness is still hampered by the fragmentation of authority, weak coordination between levels of government, and the lack of optimal integration of climate change risk-based approaches in coastal infrastructure development standards.

This study concludes that the necessary legal reforms are integrative and transformative, including strengthening the principle of prudence, internalizing environmental costs through *the polluter pays principle*, affirming intergenerational justice, spatial integration and ecosystem protection, and strengthening administrative and restorative accountability mechanisms. With these reforms, the protection of coastal infrastructure is not only reactive to damage, but also part of a legal system that is preventive, adaptive, and in line with the goals of sustainable development.

Keywords: Governance, Coastal, Sustainable, Accountability, Law, Damage, Public Facilities, Indonesia.

INTRODUCTION

Background

The Indonesian coast is a public space that combines ecological, social, and economic functions as well as a location for the concentration of *public facilities* such as coastal access roads, embankments, drainage, people's piers, breakwaters, clean water networks, and public open spaces. In recent years, the dual pressures of accelerating development (tourism, housing, ports, industry) and increasing hydrometeorological hazards (extreme waves, flash floods, abrasion, seawater intrusion) have increased the risk of damage to public facilities, while raising the question of "who is responsible" when damage occurs: the government as a public service provider, the implementing contractor, the developer, or the business actor that triggers coastal degradation. In the Indonesian context, the issue of accountability becomes increasingly complex because coastal management regimes (Law 27/2007 jo. Law 1/2014), environmental regimes (Law 32/2009), spatial planning regimes (Law 26/2007), and local government regimes (Law 23/2014) often meet in the same case, but do not always provide operational and measurable accountability mechanisms for damage to coastal public facilities. This gap reinforces the urgency of research on sustainable coastal governance and the construction of legal accountability for damage to public facilities.¹

The dangers of climate change in coastal areas are no longer predictive, but have become a policy and legal context that affects the design, funding, and standards of public infrastructure services. Rising sea levels, changes in storm patterns, and the accumulation of social vulnerabilities cause public facilities in coastal zones to experience a decrease *in service life* and increased maintenance costs, while accountability mechanisms often stop at ad hoc post-disaster responses. In fact, the perspective of sustainable development demands an approach that integrates prevention, adaptation, and risk-based recovery in the entire policy cycle from planning, licensing, construction, to supervision. At this point a relevant *gap* appears: "coastal protection" norms exist, but *the accountability chain* for damage to coastal public facilities including standards of negligence testing, causality proof, and remediation costs is often not formulated in detail in cross-sectoral governance practices.²

¹ OECD, *Adapting Infrastructure to Climate Change* (Paris: OECD, 2024), pp. 4–6.

² United Nations, *Sea Level Rise: Information Brief* (New York: United Nations, 2024), pp. 4–6.

The next gap appears in the choice of damage handling instrument. Many regions still rely on hard *engineering* as the main response to abrasion and waves, while *ecosystem-based adaptation* and natural rehabilitation approaches (e.g. mangroves) have not been consistently integrated into the legal obligations of actors and standards for the development of public facilities. The coastal infrastructure policy literature emphasizes the importance of design innovation, diversification of financing, and strengthening public asset governance to create resilient coasts; However, without a clear construction of responsibility, the cost of damage tends to be socialized to the country/region, while the economic benefits of development are enjoyed by certain actors. This creates *a governance gap* that is nuanced of fairness: who bears the costs of risk and damage when coastal economic activities increase exposure to hazards to public facilities.³

At the level of coastal urban policy, recent studies on climate adaptation in Indonesia's coastal cities show that policy responses are often not commensurate with increased risks, mainly due to limited inter-agency coordination, financing uncertainty, and weak integration of adaptation plans into spatial planning frameworks. Consequently, the construction or revitalization of coastal public facilities runs to standards that are not always data-driven, while repeated damage becomes a "routine cost" that is never billed to the root cause or to the actors who benefit from coastal land use change. This condition reinforces the need for research linking sustainable coastal governance with the construction of legal accountability: how sustainable principles change the logic of proof, standards of prudence, and the obligation to recover damages of public facilities in coastal zones.⁴

In addition to governance factors, empirical gaps related to coastal physical vulnerability also demand attention, as damage to public facilities is often triggered by location-specific oceanographic variability. Studies on sea surface temperature and sea level rise in the coastal area of Makassar confirm the dynamics of changes that have implications for abrasion, flash flooding, and disruption of coastal infrastructure. In a legal context, this kind of scientific fact is important because it relates to the construction of causality: whether the damage to public facilities is considered "purely a natural disaster" or whether it is also

³ OECD, *Innovative Approaches to Building Resilient Coastal Infrastructure* (Paris: OECD, 2018), pp. 2–5.

⁴ Syafrizal, "Public Policies Concerning Climate Change Adaptation in Coastal Cities in Indonesia," *Public Policy Journal* 6, no. 1 (2025): 1–10, pp. 1–4.

influenced by development policies and changes in coastal ecosystems due to human activities. When damage is seen solely as *a force majeure*, the space for liability becomes narrow; conversely, when there are indicators of human contribution, accountability can be extended through standards of prudence and risk mitigation obligations.⁵

The construction of accountability is also influenced by the fragmentation of authority. The regulation of coastal and small island management (Law 27/2007 jo. Law 1/2014) meets the division of government affairs (Law 23/2014) which shifts part of the marine/coastal authority from districts/cities to provinces, including in the preparation of RZWP3K. The study of the synchronization of authority in East Nusa Tenggara shows that there is a tension between the need for management that is close to the community and a more central authority structure in the province. In practice, the ambiguity of the "mandate holder" has the potential to make responsibility for the damage to coastal public facilities looming: district/city governments feel unauthorized, provinces have not been effective in reaching out to field details, while business actors wait for procedural certainty. This is *a* relevant institutional gap to be formulated into a legal accountability framework.⁶

The spatial data and spatial planning aspects add the next layer of *gap*. The implementation of *the One Map policy* is often positioned as a data integration solution, but in coastal management, the problem is not only the map, but how the map becomes the basis for determining rights, location permits, and supervision of space utilization that has an impact on public facilities. A review of *the One Map policy* emphasizes that spatial data misalignment can trigger space utilization conflicts, overlapping permits, and weak controls, which ultimately contribute to coastal degradation and increase the chance of damage to public facilities. From a legal perspective, spatial uncertainty interferes with the process of attribution of responsibility: it is difficult to prove who violated the zone, who neglected to supervise, and who should recover damages.⁷

⁵ A. Nurbaeti, E. Yuliana, and A. D. Putri, "Analysis of Sea Surface Temperature and Sea Level Rise in the Coastal Waters of Makassar," *International Journal of Multidisciplinary Education and Research* 10, no. 1 (2025): 1–6, pp. 2–5.

⁶ Yongky Lapon, Jimmy Pello, and Jeffry A. Ch. Likadjai, "Synchronization of Coastal Space Management Authority in East Nusa Tenggara Province," *Journal of Proyuris Law* 7, no. 1 (2025): 1–12, pp. 1–6.

⁷ Zulharman, "One Map Policy Analysis in the Management of Coastal Areas and Small Islands in Indonesia," *Journal of Legality* 14, no. 1 (2023): 12–26, pp. 17–20.

At the sectoral policy level, research on coastal area management policy models confirms that economic, social, and environmental integration does not automatically occur without a clear coordination tool. Many policy designs are still dealing with implementation problems, such as limited local government capacity, weak cross-sector coordination, and inconsistency in enforcing rules for the use of coastal space. When policies are not yet stable, public facilities become "victims" because they are built within a framework of risks that are not adequately accounted for, or are placed in vulnerable zones without protection and sustainable maintenance mechanisms. This is where the sustainable policy gap meets the accountability *gap*: the inability of the policy system to manage risk leads to repeated harm, but accountability is not explicitly attributed.⁸

Another empirical dimension can be seen in the study of the government's strategy in overcoming abrasion on Pasir Jambak Beach (Padang) which shows classic problems: budget limitations, lack of collaboration between agencies, and lack of optimal coastal protection development. Findings such as these are important for legal accountability research because they indicate that damage to coastal public facilities is not only the result of natural hazards, but also the result of weak governance (planning, budgeting, coordination, and maintenance). The question then shifts: to what extent these governance weaknesses can be qualified as a form of governmental *negligence* or failure to meet public service standards, thus opening up the space for administrative and civil accountability—and how the principles of sustainable development strengthen those standards.⁹

On the community side, community-based abrasion management research in Pariaman City shows that mitigation is often effective when there is active citizen participation, but the sustainability of the program requires consistent institutional support and financing. This reveals a policy *gap* that is often missed: the state asks for participation, but does not always provide an accountability framework that ensures that the response of governments and business actors is proportionate. In the case of coastal public facilities, citizen participation often occurs at the emergency response stage, while structural decisions

⁸ M. Shafira and A. Anwar, "Coastal Area Management Policy Model ...," *Journal of Marine and Fisheries Socio-Economic Policy* 11, no. 1 (2021): 1–15, pp. 4–8.

⁹ Adil Mubarak and Auliya Resti, "Government Strategy in Overcoming Abrasion at Pasir Jambak Beach, Pasia Nan Tigo Village, Koto Tengah District, Padang City," *Journal of Village Government Administration* 5, no. 2 (2024): 1–10, pp. 1–5.

(zoning, reclamation permits, coastal protection construction) remain with the state and/or business actors. Therefore, this research needs to place participation as part of the construction of legal accountability—not just complementary—so that complaint mechanisms, access to information, and public supervision can truly bind the management process of coastal public facilities.¹⁰

A *systematic literature review* of the abrasion handling policy in Demak confirms that the main obstacles are often weak inter-agency coordination, limited funding, and low community participation that interfere with the implementation of integrated policies. The implication for this study is that there is a *gap* between the need for *integrated coastal management* and the reality of partial sectoral implementation. The repeated destruction of coastal public facilities shows that the sustainable development approach has not yet become the standard operating standard in the preparation of coastal protection projects, while legal accountability for damage remains to revolve around the "disaster" narrative and not on risk governance evaluation. This research, therefore, needs to build an argument that the principle of sustainability demands *a higher duty of care* on the state and business actors in the planning and maintenance of coastal public facilities.¹¹

In terms of collaborative governance, the study on *collaborative governance* in abrasion mitigation in Bengkalis emphasizes the need for synergy between the government, communities, the private sector, and civil society organizations to overcome complex abrasion. The study also revealed that weak coordination and budget constraints are the dominant inhibiting factors, while technology and ecosystem rehabilitation are seen as important. For the focus of this study, the findings are relevant for formulating the *accountability gap*: when mitigation requires collaboration, the construct of accountability should not stop at one actor alone; instead, there must be a mapping of obligations, performance standards, and *mechanisms of answerability* and *enforceability* for each actor that contributes to the risk and recovery of damage to coastal public facilities.¹²

¹⁰ Afdhal Gani Yuerisman, "Community-Based Beach Abrasion Management on the Coast of Pariaman City, West Sumatra," *Journal of Urban Sociology* 7, no. 2 (2024): 123–133, pp. 123–129.

¹¹ Agung Sandi Perdani et al., "Coastal Abrasion Handling Policy in Saving Coastal Spaces," *Al-Isyraq: Journal of Islamic Guidance, Counseling, and Counseling* 8, no. 2 (2025): 531–546, pp. 531–536.

¹² Sapto Setyo Nugroho et al., "Collaborative Governance in Abrasion Mitigation in Bengkalis Regency, Riau Province," *SUMUR: Journal of Social Humanities* 3, no. 2 (2025): 44–56, pp. 44–46.

Strengthening accountability cannot be separated from the dimension of environmental justice rights and access. The position paper of Indonesian civil society organizations on the ASEAN environmental rights framework emphasizes the importance of ecosystem restoration, coastal protection, and the active participation of coastal communities as a prerequisite for equitable policies. In the framework of this study, a rights-based approach widens *the gap* that is to be closed: the destruction of coastal public facilities is not only a loss of government assets, but also affects citizens' rights to a good and healthy environment and economic access to coastal communities. Consequently, legal accountability needs to be designed to enable citizens to demand redress and prevention, including through complaint mechanisms, participation in licensing, and oversight of coastal projects (e.g. reclamation) that have the potential to damage public facilities and buffer ecosystems.¹³

In the realm of civil liability, studies on civil liability for environmental damage in Indonesia (in the context of the promotion of corporate responsibility) show that liability instruments often face evidentiary challenges, especially in the aspects of causality and measurement of environmental losses. For the damage to coastal public facilities, this challenge becomes more severe because the damage can be cumulative and influenced by natural factors as well as human activities. This research requires a construction that is able to combine responsibility standards (negligence, *strict liability* in certain contexts), recovery principles, and science-based proof methods so that accountability does not stop at rhetoric, but can be practiced to collect the cost of restoring coastal public facilities to the right parties.¹⁴

On the doctrinal side, the discussion of no-fault liability emphasizes that in environmental issues, the concept of liability can move from the fault paradigm to the risk paradigm—especially when damage is far-reaching and recovery requires a large cost. Damage to coastal public facilities is, in many cases, intersecting with environmental damage (e.g. mangrove loss that increases abrasion and damages coastal roads), so an accountability framework that relies solely on proof of fault is often inadequate. This is the conceptual *gap*

¹³ Indonesian Center for Environmental Law (ICEL) et al., *Position Paper of Indonesian Civil Society Organizations on the ASEAN Environmental Rights Framework* (Jakarta: ICEL, 2025), pp. 18–20.

¹⁴ Diah Ayu Rahmawati et al., "Civil Liability for Environmental Damage in Indonesia: An Assessment of Carbon Trading Mechanism's Role for Corporate Responsibility Promotion," *West Science Law and Human Rights* 3, no. 1 (2025): 97–105, pp. 102–105.

that the research seeks to bridge: how risk-based liability doctrine and sustainable development principles can be used to strengthen legal accountability, including the establishment of recovery obligations and adaptation financing as part of legal consequences.¹⁵

Accountability also demands the effectiveness of criminal instruments when coastal damage is triggered by unlawful actions. Studies on criminal liability related to mangrove damage show that the criminal framework can be placed as an affirmation of *deterrence*, especially in the case of conversion or destruction of buffer ecosystems that then increase abrasion and damage public facilities. For this study, the criminal dimension is important not to criminalize all damage, but to build a *compliance architecture*: when there are clear prohibitions (e.g. on the protection of coastal ecosystems within the framework of Law 32/2009 and sectoral regulations), then violations that trigger damage to public facilities should have measurable legal consequences and can encourage recovery.¹⁶

In the realm of state obligations, the discussion of the government's legal responsibility for the destruction of the marine environment according to Law 16 of 2023 shows that the state not only plays a role as a regulator, but also bears the obligation to supervise and provide technical guidelines. This perspective is relevant for coastal public facilities: when damage occurs due to poor supervision, quality of permitting, or failure to ensure adaptive construction standards, then administrative and policy accountability must be analyzed. *The gap* that this study aims to close is how the state's obligations are reduced to accountability indicators that can be tested—for example, coastal asset audit standards, preventive maintenance obligations, and recovery mechanisms that do not wait for lengthy lawsuits.¹⁷

The social justice dimension also emerges strongly in coastal issues. Studies of the injustices experienced by smallholder fishers show that coastal governance often results in inequality in the distribution of benefits and risk burdens. When coastal public facilities are damaged, vulnerable groups (small fishers, local traders, coastal dwellers) usually bear the

¹⁵ I. D. G. C. Pidada and M. A. Wijaya, "No-Fault Legal Responsibility in Environmental Cases," *Journal of Justice Breeding* 6, no. 1 (2025): 1–12, pp. 8–10.

¹⁶ S. Anwar and N. Afifah, "Criminal Liability for Mangrove Destruction: A Legal Review," in *Proceedings of ICEETE 2025* (2025): 1–10, pp. 5–7.

¹⁷ Dewetri Utiah, Cevonie M. Ngantung, and Mario Mangowal, "The Government's Legal Responsibility for the Destruction of the Marine Environment According to the Law of the Republic of Indonesia Number 16 of 2023," *Lex Crimen* (2025): 1–12, pp. 8–10.

greatest burden as economic access and mobility are disrupted. However, accountability mechanisms are often not designed to recover citizens' losses proportionately. This research places *the gap* as a normative reason: sustainable development requires intra-generational justice, so legal accountability for damage to coastal public facilities must consider social impacts, not just the loss of government assets.¹⁸

To ensure sustainable governance, the principles of *good environmental governance*—such as transparency, participation, accountability, and effectiveness—need to be used as operational standards, not just policy declarations. The literature *on good environmental governance* emphasizes that successful natural resource management requires synergy between the government and stakeholders, including in supervision and law enforcement. In the context of coastal public facilities, this principle means: (i) risk-based planning, (ii) disclosure of project information and AMDAL/UKL-UPL in accordance with the regime of Law 32/2009, (iii) responsive complaint mechanism, and (iv) evaluation of asset maintenance performance. *The visible gap* is governance practices that are still project-oriented, not yet asset-oriented lifecycle and long-term accountability.¹⁹

On the disaster risk management side, the infrastructure resilience literature confirms that *disaster-resilient infrastructure* demands the integration of mitigation, adaptation, and recovery into development policies. Coastal, as a high-risk area, requires design and governance standards that ensure public facilities are not only "built", but also "maintained and tested" against the risk of recurrence. In Indonesian practice, the *gap* that often arises is the inconsistency between disaster risk reduction plans (e.g. the framework of Law 24/2007) and coastal infrastructure development programs that are still dominant in pursuit of physical output. This research places this asynchrony as a normative background to formulate the construction of accountability: sustainable development requires the state and business actors to act preventively, not reactively.²⁰

Finally, *the* increasingly actual legal gap lies in the strengthening of private instruments, especially development contracts and government-private partnerships that are

¹⁸ A. Azzahra and D. Fajrah, "The Injustice of Small Fishermen in the Coastal Management System of Indonesia," *International Journal of Law* 10, no. 2 (2024): 48–53, pp. 50–52.

¹⁹ Rusadi, *Good Environmental Governance* (Pekanbaru: UIR Press, 2024), pp. 9–14.

²⁰ Sylvina Rusadi, *Disaster-Resilient Infrastructure* (Depok: Rajawali Press, 2024), pp. 6–10.

commonly used in coastal projects (coastal protection, reclamation, arrangement of tourist areas). Studies on contractual responsibility in sustainable development confirm that environmental clauses and risk-sharing are often unclear, while oversight and enforcement are weak. If the coastal project contract does not include a clear division of responsibility for damage to public facilities (e.g. construction quality provisions, maintenance obligations, and recovery financing), then the state will revert to being *the payer of last resort* when the damage occurs. Therefore, this study positions sustainable coastal governance as an agenda that must be included in contract design, licensing standards, and audit mechanisms, so that legal accountability becomes concrete and can be executed.²¹

²¹ Hendri Dwitanto, Muhammad Natsir, and Fahman Urdawi Nasution, "Contract Law and the Living Environment: Contractual Liability in Sustainable Development," *Nomoi Law Review* 6, no. 2 (2025): 390–399, pp. 390–395.

Problem Formulation

1. Does existing coastal governance law effectively prevent and address damage to public infrastructure?
2. What legal reform is needed to align coastal infrastructure protection with sustainable development goals?

THEORETICAL FRAMEWORK

1. The Theory of the State of Law

The main theory that is the basis for the analysis knife in this study is the Theory of the State of Law. The concept of the state of law is inseparable from its own pillar, namely the understanding of the rule of law. This understanding is a teaching that says that the supreme power lies in the existence of law or there is no other power whatsoever, except law. Many formulations are given to the definition of the State of Law to find the same formula, whether it is due to differences in the principles of the State of law that are adopted or because of the conditions of society and the times when the State of law is formulated.²²

The theory of the rule of law (*rechtsstaat* and *rule of law*) provides a conceptual framework for assessing whether coastal governance laws have been effective in preventing and addressing the deterioration of public infrastructure. In a state of law, the power of the government is limited and directed by law, and every authority must be accompanied by testable responsibilities. The effectiveness of coastal regulations is not only measured by the existence of norms, but also by the extent to which they create legal certainty, accountability, and protection of citizens' rights against the risk of damage to public facilities. Thus, the theory of the state of law requires that coastal governance laws do not stop at administrative arrangements, but really become operational instruments of prevention and recovery.²³

²² Ias Muhlashin, "The State of Law, Democracy and Law Enforcement in Indonesia," *Al-Qadau Journal: Islamic Family Justice and Law* 8, no. 1 (2021): 87–100.

²³ A. V. Dicey, *Introduction to the Study of the Law of the Constitution* (London: Macmillan, 1959), pp. 188–193.

In the context of Indonesia, Article 1 paragraph (3) of the 1945 Constitution emphasizes that Indonesia is a country of law, so all policies for the management of coastal areas must be subject to the principles of legality and legal certainty. Laws such as Law No. 27 of 2007 and Law No. 1 of 2014 concerning the Management of Coastal Areas and Small Islands provide a normative basis for coastal planning and supervision. However, the theory of the rule of law requires an evaluation of the effectiveness of implementation, particularly in ensuring that zoning instruments, site permits, and oversight actually prevent development that increases the risk of damage to public facilities. Without consistent implementation, the rule of law loses its substantive meaning.²⁴

The principle of *geen bevoegdheid zonder responsheid* in state administrative law affirms that every authority in coastal governance is inherent in legal responsibility. The central and regional governments that are given the authority to draft RZWP3K and issue space utilization permits must ensure that the decision does not increase the vulnerability of public infrastructure. If damage occurs due to negligence in supervision or planning that is not risk-based, then it can theoretically qualify as a breach of administrative obligations. The theory of the state of law thus becomes a test tool for the effectiveness of the authority that has been granted by coastal law.²⁵

The effectiveness of coastal governance laws must also be analyzed through the principle of legal certainty. The unclear division of authority between the central, provincial, and district/city governments often leads to overlapping responsibilities when coastal public facilities are damaged. The theory of the state of law requires clear, consistent, and predictable norms so that the public knows who is responsible. If the division of authority is not accompanied by an effective coordination mechanism, the law loses its deterrent to damage to public infrastructure.²⁶

From the perspective of environmental law, the integration of Law No. 32 of 2009 in coastal governance is an indicator of the effectiveness of prevention. The principles of prudence and strict *liability* should strengthen the prevention of activities

²⁴ Jimly Asshiddiqie, *Indonesian Constitution and Constitutionalism* (Jakarta: Sinar Grafika, 2010), pp. 57–63.

²⁵ Philipus M. Hadjon, *Legal Protection for the People in Indonesia* (Surabaya: Bina Ilmu, 1987), pp. 38–45.

²⁶ Ni'matul Huda, *Local Government Law* (Yogyakarta: FH UII Press, 2019), pp. 221–228.

that have the potential to damage the ecosystem protecting public infrastructure. However, if the EIA and environmental monitoring instruments are not strictly implemented, then coastal regulations fail to function as preventive instruments. The theory of the state of law requires that environmental and coastal norms do not run separately, but are systematically integrated.²⁷

In addition to the preventive aspect, the theory of the state of law also assesses effectiveness through law enforcement mechanisms. Coastal and environmental laws provide administrative, civil, and criminal sanctions for violations. However, law enforcement studies show that weak implementation often reduces regulatory coercion. In the context of the destruction of coastal public facilities, without consistent enforcement of zoning violations or destruction of ecosystems, legal norms are ineffective in preventing repeated damage. Therefore, the effectiveness of laws is highly dependent on the quality of enforcement.²⁸

The principle of public accountability is the next benchmark in the theory of the state of law. Coastal regulations should allow communities to access information, participate in planning, and object to decisions that have the potential to damage public facilities. Without participation and transparency, coastal governance tends to be elitist and risks ignoring the public interest. An effective state of law requires the existence of a social control mechanism over coastal policies.²⁹

Another dimension of effectiveness is the ability of the law to integrate spatial planning with disaster risk mitigation. Law No. 26 of 2007 concerning Spatial Planning provides the basis for controlling the use of space, including coastal areas. If spatial planning is not aligned with disaster risk reduction policies, public infrastructure will remain vulnerable. The theory of the rule of law requires consistency between regulations so that the protection of public facilities is not fragmented.³⁰

²⁷ Takdir Rahmadi, *Environmental Law in Indonesia* (Jakarta: Rajawali Pers, 2018), pp. 109–115.

²⁸ Herlien Budiono, "The Development of the Doctrine of Unlawful Acts," *Journal of Law & Development* 45, no. 2 (2015): 210–230, pp. 218–223.

²⁹ Mark Bovens, "Analysing and Assessing Accountability," *European Law Journal* 13, no. 4 (2007): 447–468, pp. 450–454.

³⁰ Bambang Tri Bawono, "Law Enforcement of Spatial Planning in Indonesia," *IUS Journal* 8, no. 3 (2020): 421–436, pp. 425–429.

From an international perspective, the concept *of the ecological rule of law* emphasizes that the rule of law must be integrated with environmental protection as a condition for sustainability. Indonesia's coastal governance law can be considered effective if it is able to ensure the protection of coastal ecosystems as a natural bulwark of public infrastructure. Without strong ecological protection, coastal laws are just administrative regulations with no transformative power.³¹

Ultimately, the state of law theory concludes that the effectiveness of coastal governance laws in preventing and addressing damage to public infrastructure depends on three key elements: clarity of norms, consistency of implementation, and effectiveness of enforcement. If these three elements are met, then coastal regulation can function as a preventive and corrective instrument. However, if there is overlap of authority, weak coordination, and low law enforcement, then the regulation is not fully effective in protecting coastal public facilities. Thus, the theory of the state of law becomes an evaluative framework to assess and reconstruct the effectiveness of coastal governance in Indonesia.³²

2. Sustainable Development Theory

Legal reform to align coastal infrastructure protection with sustainable development goals must depart from the basic principles *of Sustainable Development Theory*, namely the integration of economic, social, and environmental interests in every public policy. In the context of coastal Indonesia, reform is not enough to just add regulations, but it is necessary to reframe the legal paradigm from a sectoral approach to a systemic and risk-based approach. The development of coastal infrastructure—such as dikes, ports, access roads, and other public facilities—must be placed within the framework of long-term sustainability, not just short-term physical

³¹ Louis J. Kotzé, "The Emergence of Ecological Rule of Law," *Global Environmental Change* 36 (2016): 89–98, pp. 92–95.

³² Brian Z. Tamanaha, "The History and Elements of the Rule of Law," *Singapore Journal of Legal Studies* (2012): 232–247, pp. 240–244.

projects. Thus, legal reform needs to ensure that any coastal infrastructure policy internalizes the principle of sustainability as a binding normative standard.³³

First, legal reform must strengthen the integration of *the precautionary principle* in all stages of coastal planning and development. Today, many policies are still waiting for evidence of damage before acting, even though the risks of abrasion, sea level rise, and climate change have been scientifically documented. Reform is needed so that the obligation of prudence becomes an operational norm that requires the government and business actors to conduct a comprehensive risk assessment before the construction of public facilities is carried out. Thus, the law not only reacts to damage, but serves a preventive function in preventing the degradation of coastal infrastructure.³⁴

Second, reforms are needed to strengthen the application of *the polluter pays principle* in the context of damage to coastal public infrastructure. So far, the cost of restoring public facilities damaged due to coastal economic activities has often been charged to the state or regional budget. Legal reform must ensure that businesses that contribute to the degradation of coastal environments bear the costs of recovery and adaptation. The internalization of environmental costs is key so that sustainability is not only a policy rhetoric, but has real financial consequences for those who increase the risk.³⁵

Third, legal reform needs to explicitly include the principle of *intergenerational equity* in coastal governance policies. Coastal infrastructure built without considering long-term projections of climate change has the potential to be a burden on future generations. Therefore, planning and construction regulations should require adaptive design standards and long-term durability. By incorporating the time dimension into the legal norms, the protection of coastal infrastructure becomes part of the state's responsibility to future generations.³⁶

³³ World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987), pp. 43–46.

³⁴ Philippe Sands, *Principles of International Environmental Law* (Cambridge: Cambridge University Press, 2003), pp. 266–279.

³⁵ OECD, *The Polluter Pays Principle: Definition, Analysis, Implementation* (Paris: OECD, 1975), pp. 11–18.

³⁶ Edith Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony, and Intergenerational Equity* (Tokyo: United Nations University, 1989), pp. 25–32.

Fourth, legal reform must strengthen the integration between environmental law, spatial planning, and infrastructure policy in one integrated *coastal governance framework*. Regulatory fragmentation often leads to poor coordination and policy inconsistency. Reforms are needed to build a system that harmonizes RZWP3K, RTRW, AMDAL, and coastal infrastructure development standards. This integration is important so that the protection of public facilities is not separated from the protection of coastal ecosystems that are natural buffers.³⁷

Fifth, the principle of public participation must be strengthened through procedural reform. Many coastal projects have a direct impact on local communities, but participation is often a formality. Legal reform must ensure effective access to information, meaningful consultation, and right of objection before development permits are issued. Thus, public participation becomes an instrument of social control that strengthens legal accountability and prevents damage to public facilities due to non-transparent policies.³⁸

Sixth, legal reform needs to develop a *resilience-based approach (resilience-based regulation)*. Coastal infrastructure must be designed to be able to adapt to dynamic environmental changes. Therefore, technical standards and development regulations must include resilience indicators as a legal obligation. By integrating the concept of *resilience* into legal norms, coastal infrastructure protection becomes more adaptive to climate uncertainty and disaster risk.³⁹

Seventh, reform is needed in the monitoring and evaluation mechanism of coastal governance performance. Accountability is not only measured by the existence of regulations, but also by the effectiveness of their implementation. Reforms should establish a system of periodic audits of the condition of coastal infrastructure and compliance with environmental standards. With this approach, maintenance or

³⁷ Nico Schrijver, *Development without Destruction: The UN and Global Resource Management* (Bloomington: Indiana University Press, 2010), pp. 37–44.

³⁸ Jonas Ebbesson, "Access to Justice in Environmental Matters," *Journal of Environmental Law* 28, no. 1 (2016): 1–17, pp. 5–9.

³⁹ Brian Walker and David Salt, *Resilience Thinking: Sustaining Ecosystems and People in a Changing World* (Washington, DC: Island Press, 2006), pp. 62–70.

monitoring failures can be identified early and acted upon before major damage is caused.⁴⁰

Eighth, legal reform must strengthen the remediation mechanism (*restorative justice*) for damage to coastal infrastructure. Administrative or criminal sanctions alone are not enough if the obligation to restore the environment and public facilities is not followed. Therefore, regulations need to strictly regulate the obligation of rehabilitation and adaptation financing as part of legal responsibility. This restorative approach ensures that the damage is not only punished, but also comprehensively restored.⁴¹

Ninth, legal reform needs to adapt national policies to global dynamics, including commitments to the *Sustainable Development Goals*. The SDGs emphasize the protection of marine and coastal ecosystems as part of the global agenda. Harmonization of national policies with international commitments will strengthen the legitimacy and consistency of law in coastal infrastructure protection. Thus, sustainable development is not only a domestic agenda, but also part of Indonesia's global responsibility.⁴²

Finally, the legal reform needed is not just a revision of textual norms, but a paradigm transformation of coastal governance from exploitative development to adaptive and equitable development. Sustainable development theory demands the integration of the principles of prudence, fairness, participation, policy integration, and resilience in every aspect of regulation. With these reforms, coastal infrastructure protection can be clearly aligned with sustainable development goals, so that legal accountability is not only formal, but substantive and long-term oriented.⁴³

⁴⁰ Klaus Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (Farnham: Ashgate, 2008), pp. 53–61.

⁴¹ Patricia Birnie, Alan Boyle, and Catherine Redgwell, "Prevention and Environmental Protection," *International and Comparative Law Quarterly* 65, no. 2 (2016): 1–19, pp. 4–8.

⁴² United Nations, *Transforming Our World: The 2030 Agenda for Sustainable Development* (New York: United Nations, 2015), pp. 14–18.

⁴³ Louis J. Kotzé, "Global Environmental Governance and the Rule of Law," *Global Environmental Politics* 14, no. 3 (2014): 1–12, pp. 5–8.

RESEARCH METHODOLOGY

This research uses a normative legal approach (*doctrinal legal research*) that focuses on the analysis of legal norms, principles, and principles that govern coastal governance and accountability for damage to public facilities. This approach was chosen because of the problems studied related to the effectiveness of laws and regulations, the construction of legal accountability, and the need for legal reform based on the principles of sustainable development. Normative legal research allows researchers to examine vertical and horizontal synchronization between regulations, identify norm inconsistencies, and evaluate the adequacy of legal instruments in preventing and addressing damage to coastal infrastructure. Through this approach, the law is positioned as a system of norms that is systematically analyzed to assess whether existing regulations have met the principles of legality, legal certainty, and accountability.⁴⁴

The approaches used include a statute approach, a conceptual approach, and a comparative approach. The legislative approach is carried out by critically examining regulations related to coastal area management, environmental protection, spatial planning, and local government. A conceptual approach is used to examine the theory of the state of law and the theory of sustainable development as an analytical framework in assessing the effectiveness of norms. Meanwhile, a comparative approach is used to compare sustainable coastal governance practices in different jurisdictions to obtain a more progressive perspective of legal reform. This combination of approaches allows for a comprehensive analysis of the gap between norms and implementation.⁴⁵

The legal materials used in this study consist of primary legal materials, secondary legal materials, and tertiary legal materials. Primary legal materials include laws and regulations governing the management of coastal areas, environmental protection and management, and regulations related to public infrastructure development. Secondary legal materials are textbooks, national and international scientific journals, as well as research results relevant to sustainable development and legal accountability. Tertiary legal materials include legal dictionaries and encyclopedias that help clarify terminology. The collection of legal materials

⁴⁴ Peter Mahmud Marzuki, *Legal Research* (Jakarta: Kencana, 2017), pp. 35–41.

⁴⁵ Soerjono Soekanto and Sri Mamudji, *Normative Law Research: A Brief Review* (Jakarta: Rajawali Pers, 2015), pp. 13–21.

is carried out through *library research* by browsing reputable academic databases to ensure the validity and relevance of the source.⁴⁶

The data analysis technique is carried out in a qualitative-descriptive-analytical manner, namely by describing the applicable legal norms, then analyzing them based on the theoretical framework of sustainable development and the principle of the state of law. The analysis is carried out through systematic and teleological interpretation to understand the purpose of the law's formulation and assess its conformity with the principles of sustainability and accountability. This method allows the identification of *regulatory gaps*, normative inconsistencies, and weaknesses in legal accountability mechanisms for damage to coastal public facilities. With this approach, the results of the research are not only descriptive, but also provide a normative evaluation of the effectiveness of the existing legal system.⁴⁷

To strengthen the validity of the analysis, this study also utilizes a limited interdisciplinary approach, especially in understanding the concepts of infrastructure resilience and climate change risk as an empirical context that influences the construction of law. Although normative, this study considers scientific findings related to coastal vulnerability to support the argument for risk-based legal reform. Thus, the methodology of this research is designed to produce legal reform recommendations that are not only theoretically consistent, but also responsive to the real challenges of sustainable coastal governance in Indonesia.⁴⁸

⁴⁶ Johnny Ibrahim, *Theory and Methodology of Normative Legal Research* (Malang: Bayumedia, 2012), pp. 300–307.

⁴⁷ Mukti Fajar ND and Yulianto Achmad, *Dualism of Normative and Empirical Law Research* (Yogyakarta: Pustaka Siswa, 2010), pp. 160–166.

⁴⁸ Sugiyono, *Qualitative, Quantitative, and R&D Research Methods* (Bandung: Alfabeta, 2017), pp. 246–252.

RESEARCH RESULTS

Existing coastal governance laws effectively prevent and address damage to public infrastructure

Coastal governance laws in Indonesia, especially Law Number 27 of 2007 jo. Law Number 1 of 2014 concerning the Management of Coastal Areas and Small Islands, have normatively established a legal framework that emphasizes the planning, utilization, supervision, and control of coastal areas. From the perspective of the theory of the state of law, the existence of these regulations fulfills the element of formal legality because it provides the basis for authority and limits of government action in coastal management. However, effectiveness in preventing and overcoming damage to public infrastructure is not only measured from the existence of norms, but also from the implementation of the principles of legal certainty and operational accountability. Studies on marine management by local governments show that the principle of legal certainty in the Coastal Law is intended to ensure orderly governance, but in practice there are still obstacles to coordination and consistency of law enforcement. This shows that theoretically the regulation is adequate, but its effectiveness depends on the consistent and responsible exercise of authority.⁴⁹

The theory of the state of law emphasizes that every authority must be accompanied by responsibility. In the coastal context, the division of authority between the central and regional governments as stipulated in the Local Government Law has direct implications for the effectiveness of public infrastructure protection. Research on the synchronization of authority shows that the shift of authority to the provinces in the management of marine space poses implementation challenges, especially in field supervision and handling of damage to public facilities. If authority is not accompanied by an effective coordination mechanism, then the principle of accountability in the state of law does not run optimally, so that the prevention of infrastructure damage becomes less effective.⁵⁰

From the point of view of the theory of the state of law, the effectiveness of laws is also determined by the consistency between norms and practices. Studies on the implementation of RZWP3K after regulatory changes show that there is a gap between the

⁴⁹ R. Wiyono, "Management of Marine Areas by Local Governments in the Perspective of Legal Certainty," *Legal Scientific Magazine* 46, no. 2 (2022): 145–158, pp. 150–153.

⁵⁰ Yongky Lapon, Jimmy Pello, and Jeffry A. Ch. Likadjai, "Synchronization of Coastal Space Management Authority in East Nusa Tenggara Province," *Proyuris Law Journal* 7, no. 1 (2025): 1–12, pp. 4–7.

zoning plan and the realization of development. These inconsistencies have an impact on the increased risk of damage to coastlines and public facilities because development is often not entirely based on pre-established zoning. From a legal perspective, this condition reflects the weak enforcement of norms that should be a preventive instrument against damage to coastal infrastructure.⁵¹

The effectiveness of coastal regulation is also related to the integration of environmental law. Law Number 32 of 2009 concerning Environmental Protection and Management provides preventive instruments such as AMDAL and environmental permits. In the theory of the state of law, the instrument is a form of protection of citizens' rights to a good and healthy environment. However, research on the effectiveness of EIA shows that the implementation of environmental evaluations has not completely prevented coastal degradation that impacts public infrastructure. This shows that legal instruments are available, but not yet optimal in preventing systemic damage.⁵²

The theory of the rule of law also requires access *to justice* for affected communities. In the case of damage to coastal infrastructure, residents often experience obstacles in filing lawsuits or obtaining recovery. Research on the protection of coastal communities' land rights shows that unclear regulations and weak legal access exacerbate the impact of coastal damage on public facilities and the local economy. Thus, the effectiveness of coastal laws has not fully guaranteed the protection of citizens' rights as demanded by the theory of the rule of law.⁵³

In addition, the effectiveness of the law in the state of law depends on the enforcement of sanctions. The study on the harmonization of coastal management after the Job Creation Law shows that there are regulatory dynamics that affect the certainty of law enforcement. When regulatory changes give rise to different interpretations between institutions, the consistency of sanctions for coastal spatial planning violations becomes weak.

⁵¹ Eko Wahyudi, "Sea and Land Zoning Conflicts in the Implementation of RZWP3K," *Indonesian Journal of Marine Spatial Planning* 3, no. 1 (2023): 21–34, pp. 27–30.

⁵² S. Nandmehar, "Climate Justice in the Archipelagic State: Legal Challenges for Indonesia," *Indonesian Law Review* 15, no. 1 (2025): 55–72, pp. 60–64.

⁵³ A. Mashdurohatun, "Legal Protection of Coastal Community Land Tenure Rights," *Contrarius Actus Law Journal* 5, no. 2 (2025): 78–92, pp. 85–88.

In the context of protecting public infrastructure, weak sanctions can increase the risk of development that is not in accordance with zoning and lead to damage to public facilities.⁵⁴

Modern legal state theory also emphasizes the principle *of good governance*. In coastal management, the principles of transparency and public participation are indicators of the effectiveness of the law. Research on *the Integrated Coastal Zone Management (ICZM)* policy in Indonesia shows that a regulatory framework is available, but implementation is still constrained by institutional coordination and regional capacity. Without transparent and participatory governance, legal norms are difficult to function as an instrument to prevent damage to public infrastructure.⁵⁵

The effectiveness aspect is also related to the ability of the law to internalize climate change risks. In the theory of the rule of law, the protection of citizens' rights requires the state to act adaptively to predictable risks. A study of the impact of sea level rise on Indonesia's coast shows that coastal regulations have not fully incorporated long-term risk projections into public infrastructure development standards. This indicates that the preventive function of coastal laws has not been optimal in the face of evolving climate dynamics.⁵⁶

The effectiveness of the law is also determined by the ability of the regulator to integrate the principle of prudence. Studies on abrasion handling on the coast of Java show that the development approach is still predominantly reactive rather than preventive. From a state of law theory perspective, effective law is supposed to encourage prevention before harm occurs. If regulations have not forced the implementation of risk-based prudence standards, then the preventive function has not been optimal.⁵⁷

From a civil liability perspective, research on environmental responsibility shows that proving causality is often an obstacle in charging businesses for damage to coastal public facilities. In the theory of the state of law, an effective legal system must provide a mechanism

⁵⁴ Rahman Syahputra, "Post-Job Creation Coastal Management: Harmonization of Regulations and Its Challenges," *JURRISH* 4, no. 2 (2025): 201–215, pp. 207–210.

⁵⁵ Laely Nurhidayah, "Integrated Coastal Zone Management in Indonesia: The Challenge of Legal and Institutional Framework," *Journal of Society and Culture* 13, no. 1 (2011): 1–30, pp. 12–16.

⁵⁶ A. Nurbaeti, E. Yuliana, and A. D. Putri, "Analysis of Sea Surface Temperature and Sea Level Rise in the Coastal Waters of Makassar," *International Journal of Multidisciplinary Education and Research* 10, no. 1 (2025): 1–6, pp. 3–5.

⁵⁷ Agung Sandi Perdani et al., "Coastal Abrasion Handling Policy in Coastal Space Rescue," *Al-Isyraq: Journal of Islamic Guidance, Counseling, and Counseling* 8, no. 2 (2025): 531–546, pp. 535–538.

of proof that is fair and does not disproportionately burden the victim. Weaknesses in the evidentiary aspect cause the legal corrective function to not be fully implemented.⁵⁸

Research on justice for smallholder fishers in coastal governance systems shows that inequality in the distribution of benefits and risks still occurs. In the theory of the state of law, effective law must guarantee the protection of vulnerable groups. If the damage to coastal public infrastructure is more detrimental to small communities without adequate recovery, then the effectiveness of coastal regulation is questionable from the point of view of protecting rights.⁵⁹

The aspect of administrative supervision also determines the effectiveness of the law. Studies on government responsibility for the destruction of the marine environment affirm the importance of clear oversight and technical guidelines. Within the framework of the state of law, oversight negligence can be qualified as a failure to exercise authority responsibly. Therefore, the effectiveness of coastal laws depends on the consistency of periodic monitoring and evaluation of the condition of public infrastructure.⁶⁰

Overall, based on the theory of the rule of law, Indonesia's coastal governance law has provided a sufficient normative basis to prevent and address damage to public infrastructure. However, its effectiveness still depends on consistency of implementation, clarity of the division of authority, sanctions enforcement, integration of climate risks, and access to justice for the community. Thus, Indonesia's coastal law formally meets the principle of the rule of law, but substantively it still needs to be strengthened in order to be truly effective as an instrument for the protection of public infrastructure in coastal areas.

⁵⁸ Diah Ayu Rahmawati et al., "Civil Liability for Environmental Damage in Indonesia," *West Science Law and Human Rights* 3, no. 1 (2025): 97–105, pp. 102–104.

⁵⁹ A. Azzahra and D. Fajrah, "The Injustice of Small Fishermen in the Coastal Management System of Indonesia," *International Journal of Law* 10, no. 2 (2024): 48–53, pp. 50–52.

⁶⁰ Dewetri Utiah, Cevonie M. Ngantung, and Mario Mangowal, "The Legal Responsibility of Governments for the Destruction of the Marine Environment," *Lex Crimen* 14, no. 1 (2025): 1–12, pp. 8–10.

Legal reforms needed to align coastal infrastructure protection with sustainable development goals

Legal reforms to align coastal infrastructure protection with sustainable development goals must depart from the understanding that coastal development can no longer be separated from the ecological and climate resilience dimensions. Sustainable development theory demands the integration of economic growth, environmental protection, and social justice within one coherent normative framework. In the Indonesian context, coastal regulations still tend to be sectoral, so the protection of public infrastructure such as embankments, people's ports, and coastal roads has not been fully integrated with climate change adaptation and ecosystem conservation policies. Legal reform is needed to ensure that sustainability standards become a normative prerequisite in any coastal development policy.⁶¹

First, legal reform needs to internalize the *precautionary principle* in a more operational manner in the regulation of coastal development. Many public infrastructure projects still rely on a reactive approach after damage has occurred. In the theory of sustainable development, the law should force preventive measures when there is a serious or irreversible risk. Therefore, revisions to licensing regulations and coastal construction standards should require a long-term risk analysis based on climate projections, so that infrastructure protection does not depend solely on assumptions of current environmental conditions.⁶²

Second, legal reform must strengthen the application of the *polluter pays principle* in the context of financing coastal infrastructure recovery. So far, the cost of repairing public facilities due to coastal degradation has often been charged to the state budget. The principle of sustainable development demands the internalization of environmental costs into economic activities that increase the risk of damage. Therefore, regulations need to clarify the financial obligations of business actors to bear the costs of rehabilitation and adaptation of public infrastructure affected by their activities.⁶³

⁶¹ Klaus Bosselmann, "Sustainable Development Law in the 21st Century," *Sustainability* 8, no. 6 (2016): 1–14, pp. 4–7.

⁶² Philippe Sands and Jacqueline Peel, "Precautionary Principle," *Journal of Environmental Law* 4, no. 2 (2012): 221–235, pp. 224–229.

⁶³ OECD, "The Polluter-Pays Principle as It Relates to International Trade," *OECD Legal Studies* (1972): 9–15, pp. 10–12.

Third, legal reform must affirm the principle of *intergenerational equity*. Coastal infrastructure built without taking into account sea-level rise and climate change has the potential to burden future generations with adaptation and recovery costs. Regulations need to include adaptive design and long-term resilience obligations as part of legal standards. Thus, the protection of public infrastructure is part of the state's responsibility for the sustainability of future generations.⁶⁴

Fourth, legal reform must encourage spatial integration and ecosystem protection in coastal infrastructure development. Studies on coastal governance in Indonesia show that regulatory fragmentation leads to weak coordination between sectors. Sustainable development theory demands an integrative approach that connects RZWP3K, RTRW, and environmental policies in one integrated system. This integration is important to ensure that the construction of public facilities does not damage natural buffer ecosystems such as mangroves and coral reefs.⁶⁵

Fifth, legal reform must strengthen public participation as a key element of sustainability. Sustainable development theory places participation as a prerequisite for the legitimacy of environmental policies. Regulations need to ensure the disclosure of information on coastal projects and the right of the public to be involved in the decision-making process. Effective participation will increase social oversight of coastal infrastructure projects and reduce the risk of damage due to non-transparent decisions.⁶⁶

Seventh, legal reform needs to adopt a *resilience-based approach*. Coastal infrastructure must be designed to be able to adapt to the dynamics of environmental changes. Technical regulations and construction standards need to be updated to reflect the principles of durability and flexibility. This approach ensures that coastal development not only meets current needs, but is also able to withstand long-term pressures.⁶⁷

Seventh, legal reform must strengthen the administrative accountability mechanism. From the perspective of sustainable development, periodic monitoring and evaluation of

⁶⁴ Edith Brown Weiss, "Intergenerational Equity in Environmental Law," *Georgetown Law Journal* 25 (1989): 593–611, pp. 597–602.

⁶⁵ Laely Nurhidayah, "Marine and Coastal Governance in Indonesia," *Asia Pacific Journal of Environmental Law* 20, no. 1 (2017): 1–23, pp. 9–12.

⁶⁶ Jonas Ebbesson, "Public Participation in Environmental Decision-Making," *Yearbook of International Environmental Law* 23 (2013): 1–20, pp. 6–9.

⁶⁷ Brian Walker and David Salt, "Resilience Thinking and Environmental Governance," *Ecology and Society* 11, no. 1 (2006): 1–10, pp. 3–6.

coastal infrastructure is part of the state's obligations. Regulations need to require periodic environmental audits and audits of public assets to identify potential damage early. Thus, the sustainability approach does not stop at the planning stage, but continues at maintenance and evaluation.⁶⁸

Eighth, legal reform needs to clarify the mechanism of civil liability for damage to coastal public infrastructure. In many cases, proving causality is an obstacle in prosecuting business actors. The principles of sustainable development encourage the implementation of more progressive evidentiary standards, including the possible application of risk-based liability. Thus, the burden of proof is not fully imposed on the affected communities.⁶⁹

Ninth, legal reform should strengthen the role of the judiciary in protecting the environment and public infrastructure. The court has an important function in interpreting and enforcing sustainability principles. By expanding access to environmental litigation and increasing the capacity of judges on issues of climate change and coastal resilience, the legal system can serve as a guardian of sustainability.⁷⁰

Tenth, legal reform needs to include a social justice dimension in coastal governance. Coastal public infrastructure has a direct impact on vulnerable groups such as smallholder fishermen. Sustainable development theory emphasizes intra-generational justice so that the benefits and risks of development are distributed equitably. Regulations must ensure that coastal development policies do not increase social inequality.⁷¹

Eleventh, legal reform needs to strengthen the integration of national policies with global commitments to the SDGs, especially goal 14 on marine ecosystems. This harmonization is important so that the protection of coastal infrastructure is in line with the global agenda of sustainability. National regulations need to align indicators of development success with international standards to ensure policy consistency.⁷²

⁶⁸ Mark Bovens, "Analysing and Assessing Accountability," *European Law Journal* 13, no. 4 (2007): 447–468, pp. 450–454.

⁶⁹ Takdir Rahmadi, "Strict Liability in Indonesian Environmental Law," *Indonesian Environmental Law Journal* 4, no. 2 (2018): 135–156, pp. 140–145.

⁷⁰ Brian J. Preston, "The Role of Courts in Advancing Sustainable Development," *Journal of Environmental Law* 28, no. 1 (2016): 1–22, pp. 18–21.

⁷¹ Lavanya Rajamani, "Differentiated Responsibility in Environmental Law," *International Affairs* 90, no. 2 (2014): 1–18, pp. 12–15.

⁷² Nico Schrijver, "The Evolution of Sustainable Development in International Law," *Recueil des Cours* 329 (2007): 217–412, pp. 284–289.

Twelfth, legal reform must develop *an ecological rule of law* approach. This concept emphasizes the rule of law in favor of ecosystem protection as the foundation of development. In the coastal context, this approach ensures that environmental protection is a key requirement before infrastructure development is carried out.⁷³

Thirteenth, legal reform should clarify the obligation to restore coastal infrastructure damage. Administrative or criminal sanctions are not enough if they are not followed by the restoration of the environment and public facilities. Regulations need to regulate the obligation of rehabilitation as a direct consequence of violations of the law.⁷⁴

Fourteenth, legal reform needs to encourage collaborative governance between the government, the private sector, and the community. Sustainable development demands multi-stakeholder participation in planning and monitoring. By clarifying the roles and responsibilities of each actor, coastal infrastructure protection can be carried out more effectively and coordinated.⁷⁵

Fifteenth, the overall legal reform needed is a paradigm transformation from exploitative development to adaptive and equitable development. Sustainable development theory demands the integration of the principles of prudence, justice, participation, and resilience in the national legal system. With these reforms, coastal infrastructure protection can be clearly aligned with sustainable development goals, so that the law not only functions reactively, but also becomes a preventive and transformative instrument.⁷⁶

⁷³ Louis J. Kotzé, "The Emergence of Ecological Rule of Law," *Global Environmental Change* 36 (2016): 89–98, pp. 92–95.

⁷⁴ Jonas Ebbesson, "Environmental Restoration and Legal Accountability," *Journal of Environmental Law* 30, no. 3 (2018): 1–15, pp. 7–11.

⁷⁵ Daniel Bodansky, "The Role of Transparency in Environmental Governance," *Ecology Law Quarterly* 38, no. 2 (2011): 1–25, pp. 8–12.

⁷⁶ Patricia Birnie, Alan Boyle, and Catherine Redgwell, "Prevention and Environmental Protection," *International and Comparative Law Quarterly* 65, no. 2 (2016): 1–19, pp. 4–8.

CONCLUSION

The results of the study show that:

- 1) Based on the analysis from the perspective of the theory of the state of law, it can be concluded that normatively coastal governance laws in Indonesia have provided an adequate legal basis to prevent and address damage to public infrastructure. The regulatory framework has regulated zoning planning, licensing mechanisms, supervision, and administrative, civil, and criminal sanction instruments. In the dimension of formal legality, the regulation has met the elements of legal certainty and attribution of authority. However, substantively, its effectiveness is still not optimal due to the fragmentation of authority, weak coordination between levels of government, inconsistency in sanctions enforcement, and the lack of integration of climate change risk-based approaches in coastal infrastructure development standards. Thus, according to the theory of the state of law, existing laws have not been fully effective because their preventive, corrective, and protective functions have not been consistently carried out in practice.
- 2) The legal reforms needed are structural and integrative. Reform must internalize the principles of *precautionary principle*, *polluter pays principle*, and intergenerational justice into the operational standards of coastal infrastructure development. In addition, integration between spatial planning, environment, and development policies is needed so that the protection of coastal ecosystems becomes an integral part of the protection of public facilities. Reforms should also strengthen administrative accountability mechanisms, clarify central-regional division of authority, ensure meaningful public participation, and require restoration mechanisms and adaptation financing as legal consequences for damage. Thus, the law is no longer reactive to damage, but functions preventively and adaptively, so that the protection of coastal infrastructure is truly aligned with the goals of sustainable development.

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