

***Legal Construction of Liability for Damage to Coastal Public Infrastructure: A Sustainable Development Perspective***

Rudy Mulyanto<sup>1</sup>, Lazarus Tri Setyawanta<sup>2</sup>, Budi Ispriyarso<sup>3</sup>

<sup>1</sup>Doctoral Program in Law, Faculty of Law, Diponegoro University, Semarang

<sup>2,3</sup>Lecturer in Law, Faculty of Law, Diponegoro University, Semarang

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[rudymulyanto@students.undip.ac.id](mailto:rudymulyanto@students.undip.ac.id)

**ABSTRACT**

This study aims to analyze the legal framework that governs responsibility for the damage to public facilities in coastal areas from the perspective of the theory of the rule of law and examine how the principles of sustainable development can strengthen legal accountability in the protection of coastal infrastructure. Although normatively Indonesia already has various regulations governing the management of coastal areas, the environment, spatial planning, and local government, in practice there are still gaps between norms and implementation, especially in the division of authority, supervisory mechanisms, and accountability effectiveness. This research uses normative legal research methods with legislative, conceptual, and case approaches. The analysis was carried out on laws and regulations related to the management of coastal areas, environmental protection, spatial planning, and administrative, civil, and criminal responsibilities. The framework of analysis is based on the Theory of the State of Law which emphasizes the principles of legality, accountability, and protection of citizens' rights, as well as the Theory of Sustainable Development which integrates the principles of prudence, intergenerational justice, *polluter pays principle*, policy integration, public participation, and ecological restoration.

The results of the study show that normatively the Indonesian legal framework has provided a legal basis for claiming responsibility for damage to coastal public facilities, both through administrative, civil, and criminal mechanisms. However, its effectiveness is still hampered by overlapping authority, weak coordination between agencies, and the lack of optimal application of sustainable development principles in coastal infrastructure planning and supervision. The integration of sustainable development principles into the national legal system has been proven to expand the scope of accountability from reactive to preventive and adaptive to climate change risks. Thus, strengthening coastal infrastructure protection requires synergy between the principles of the rule of law and the principles of sustainable development in order to realize a more responsive, fair, and long-term oriented legal accountability system.

***Keywords: Construction, Law, Responsibility, Damage, Infrastructure, Public, Coastal, Development, Sustainable.***



## INTRODUCTION

### Background

Coastal areas are strategic spaces that accommodate ecological, social, and economic functions at the same time, but at the same time are the most vulnerable locations to damage to public infrastructure due to abrasion, flash floods, storms, and development pressures. Damage to coastal roads, embankments, people's docks, drainage channels, coastal protection, and basic utilities can no longer be understood as a purely technical incident, but rather as a matter of risk governance and legal accountability that determines the sustainability of public services. In the context of sustainable development, the destruction of coastal public infrastructure poses multi-layered consequences: disruption of local economic access, increased post-disaster recovery costs, and weakened resilience of coastal communities to climate shocks. However, policy responses in many countries show that scientific and economic arguments alone are often not enough to drive action; A legal framework is needed that organizes preventive obligations, funding, adaptive technical standards, and the division of responsibilities across actors in a clear manner so that coastal infrastructure protection does not stop at ad hoc projects.<sup>1</sup>

The acceleration of climate change increases the risk of coastal damage and shifts the problem of public infrastructure into *a loss and damage* issue that demands clarity of responsibility. Recent modelling studies show that when global warming exceeds a certain threshold, adaptation costs and coastal economic losses increase sharply and are unevenly distributed, with a relatively heavier burden on regions with limited fiscal capacity. For developing countries and island nations, the implications are not only on coastal protection design, but also on the capacity to prove cause and effect, setting standards of prudence, and determining who bears the cost of restoring public infrastructure when damage is repeated. At this point, the question of "legal construction of responsibility" becomes relevant: law needs to map the relationship between systemic climate risks and human actions that exacerbate vulnerability, while ensuring that compensation and recovery mechanisms are not held back by authority and financing debates.<sup>2</sup>

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<sup>1</sup> OECD, *Innovative Approaches to Building Resilient Coastal Infrastructure* (Paris: OECD, 2018), pp. 1–15.

<sup>2</sup> Tony E. Wong et al., "Coastal adaptation and damage costs at different global warming thresholds," *npj Natural Hazards* 2, art. 35 (2025): 1–9, pp. 1–3.

At the conceptual level, sustainable development requires the integration of coastal policies across sectors through *integrated coastal zone management (ICZM)*, but the practice is often hampered by sectoral approaches that distort authority and obscure accountability. Failure to coordinate between spatial planning, development licensing, protective ecosystem management, and maintenance of public infrastructure leads to inconsistent preventive measures, while post-damage recovery often occurs without legal evaluation for *policy failures* or administrative negligence. This creates a normative-operational gap: the planning tools are in place, but accountability instruments for assessing whether coastal development decisions have met the standards of prudence and sustainability have not yet been sharply formulated. Thus, the legal construction of responsibility for damage to coastal public infrastructure needs to be laid as part of strengthening *the ICZM* so that every coastal governance decision has measurable legal consequences.<sup>3</sup>

In Indonesia, the dynamics of abrasion and extreme waves have caused real damage to coastal public facilities, including roads, service buildings, and community economic facilities. Field studies show that the damage is not only a physical problem, but also affects a sense of security, psychological health, and social solidarity, as well as cutting off access to mobility and productivity. This empirical fact confirms that coastal public infrastructure has the character of "welfare infrastructure" which, if damaged, has a ripple effect on the basic rights of citizens. But in practice, accountability often stops at the narrative of natural disasters, without adequate legal judgment of policy contributions, maintenance negligence, or development that diminishes the protectiveness of nature. This is the *gap* that reinforces the urgency of the research: there needs to be a legal construction that is able to distinguish between inevitable natural risks and increased risks due to the actions/omissions of certain actors, so that recovery is not always imposed on victims or public budgets alone.<sup>4</sup>

Damage to coastal public infrastructure is also related to the quality of government strategies in mitigation and adaptation. The findings of the village government administration research illustrate that the abrasion management strategy can run not optimally due to limited resources, coordination, and policy seriousness, so that the actions taken are

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<sup>3</sup> Laely Nurhidayah, "Integrated coastal zone management in Indonesia: the challenge of legal and institutional framework," *Journal of Society and Culture* (2011): 1–30, pp. 3–6.

<sup>4</sup> 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. 123–131.

inadequate to deal with the rate of damage. From the perspective of sustainable development law, this condition raises a normative question: to what extent can the state (central/regional) be held accountable for the failure to *prevent* when the damage is repeated and predictable. Therefore, research on liability for damage to coastal public infrastructure needs to position the "strategy" not just as a discretionary policy, but as a legal obligation that must meet certain standards, including the principles of prudence, transparency, and performance accountability.<sup>5</sup>

Within the framework of national law, coastal management has been regulated through Law No. 27 of 2007 in conjunction with Law No. 1 of 2014, as well as related to Law No. 26 of 2007 concerning Spatial Planning and Law No. 23 of 2014 concerning Regional Government which affects the distribution of authority. However, *the actual gap* that often arises is the distance between the regulatory design of coastal management and the operationalization of responsibility when coastal public infrastructure is damaged: who is primarily responsible, how maintenance standards are established, and how remediation mechanisms are activated without reliance on political claims or incidental relief schemes. Normative-empirical research on the implementation of the PWP3K Law shows that there are implementation constraints that make management objectives not run as they should, so that coastal spaces are vulnerable to conflict, disorder, and repeated damage. This condition shows the need for a more functional construction of responsibility: not just mentioning authority, but formulating legal consequences for failure to implement that has an impact on the destruction of public services.<sup>6</sup>

From the perspective of marine sectoral policy, the study of the coastal area management policy model emphasizes that coastal law instruments are the basis for optimizing utilization as well as control. However, strengthening policies does not automatically result in clarity of accountability for damage to coastal public infrastructure because it often focuses on planning and programs, rather than on accountability regimes: feasibility standards, risk audits, and recovery financing mechanisms that determine who pays, when, and through what procedures. From a sustainable development perspective,

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<sup>5</sup> 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. 1–4.

<sup>6</sup> Suparto, "Management of Coastal Areas and Small Islands," (2021): 1–28, pp. 1–6.

clarity of responsibility is key so that coastal management policies do not normalize damage as "development costs", but rather uphold the principle that any coastal development must bear the consequences of proportionate maintenance and restoration. Therefore, this study places *a gap* at the wedge between coastal management policy and liability law for damage to public facilities which is a prerequisite for basic services.<sup>7</sup>

Doctrinally, the government's responsibility in the provision of public services, including the maintenance and protection of infrastructure, is closely related to government authorities and actions, both in the form of decisions and factual actions. When damage to coastal public infrastructure occurs due to maintenance negligence, planning errors, or failure to supervise activities that exacerbate abrasion (e.g. sand extraction, reclamation that alters current dynamics, or development that closes drainage channels), then the main issue is how to construct the relationship between authority and responsibility so that it is not interrupted by bureaucratic reasons. The administrative law textbook emphasizes that the government's legal accountability is inherent in the actions of the government and is part of the legal protection of citizens, so that the "present state" does not stop at the post-damage response, but also the prevention that can be legally tested. Thus, this research fills a conceptual gap: operationalizing administrative accountability into the context of complex and multi-actor coastal public infrastructure damage.<sup>8</sup>

In practice, coastal public infrastructure restoration almost always involves interaction between governments, contractors, and communities. Here, the civil liability aspect becomes important, especially when the damages are related to unlawful acts or negligence that can be assessed through a standard of prudence. Indonesian environmental law literature explains that environmental responsibility and restoration can be attached to the person in charge of business/activities, including through the concept of faultless liability under certain conditions, as well as opening up room for lawsuits by the government/local government for recovery. This linkage is relevant for coastal public infrastructure because the damage to protective ecosystems (mangroves, seagrass beds, reefs) often has direct implications for the physical damage of public facilities; This means that infrastructure restoration cannot be

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<sup>7</sup> M. Shafira et al., "Coastal Area Management Policy Model ...," *Journal of Marine and Fisheries Socio-Economic Policy* (2021): 1–15, pp. 4–7.

<sup>8</sup> Drafting Team, *Textbook of State Administrative Law* (Purwokerto: JDIH Jenderal Soedirman University, 2022), pp. 19–25.

separated from the environmental restoration regime. However, *the gap* that is still evident is the lack of construction that explicitly links the destruction of the coastal environment with the destruction of public infrastructure as a loss that can be claimed to be remedied through effective legal mechanisms.<sup>9</sup>

Law enforcement of environmental damage—which is often the root cause of coastal infrastructure damage—also shows procedural gaps. Studies on environmental law enforcement through civil channels confirm that there are two dispute resolution pathways, but enforcement practices are often more administrative/criminal dominant, so that the recovery of losses and the restoration of environmental functions are not always optimally achieved. In coastal areas, this condition results in the recovery of public infrastructure (coastal roads, embankments, people's port facilities) which is often financed by the State Budget/Regional Budget without *an adequate cost recovery* mechanism from the parties that contribute to the damage. Therefore, research on the "construction of the law of responsibility" is needed to design a formula that links civil enforcement, environmental restoration, and restoration of public infrastructure so that the principle of sustainable development does not stop as a slogan, but rather becomes an executable design of accountability.<sup>10</sup>

A sustainable development perspective demands that coastal public infrastructure damage be treated as a risk that must be managed in a participatory manner, not simply addressed when a disaster has already occurred. The literature on abrasion mitigation based on local wisdom shows that disaster management is not only a government task, but also a social obligation that can be strengthened through community-based empowerment. However, at the same time, the principle of participation should not be the reason for shifting the burden of responsibility from the state or business actors to the community; Participation must be placed as a reinforcement of policy legitimacy and effectiveness, while financing, technical standards, and legal accountability remain within the framework of state obligations and the obligations of business actors according to their roles. *The visible gap* is the blurring of the boundaries between participation and responsibility: when communities are engaged,

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<sup>9</sup> M. H. Muhjad, *Environmental Law: An Introduction to the Indonesian Context* (Banjarmasin: Faculty of Law, Lambung Mangkurat University, 2014), pp. 221–223.

<sup>10</sup> Sri Aprita, "Environmental Law Enforcement Through ...," *CASE 2*, no. 1 (2024): 209–220, pp. 209–213.

there is often no accountability design that ensures government/contractor decisions and actions remain testable in the event of damage or protection failure.<sup>11</sup>

In the context of collaborative governance, research on *collaborative governance* in abrasion mitigation shows the effectiveness of the responsibility of the central and regional governments in tackling abrasion according to disaster mandates. The findings are important because coastal public infrastructure damage is often in the "grey zone" between coastal management regimes (PWP3K Law), disaster regimes (Law No. 24 of 2007), and public works/construction regimes. When a coastal protection project is late, not completed, or of low quality, the impact is directly on the damage to public facilities that are supposed to be protected. *The current gap* that needs to be answered by research is how to construct collaborative responsibility so that it does not become a reason for "shared responsibility" which in practice "responsibility does not exist", but becomes a model of the division of obligations that is clear, measurable, and enforceable through legal mechanisms.<sup>12</sup>

In addition to the government, business actors in coastal areas are often a factor that increases the vulnerability of public infrastructure, either through activities that damage protective ecosystems, narrow coastal boundaries, or increase environmental burdens without adequate control. The article on corporate legal responsibility emphasizes that parties who damage the environment and cause losses to society or the state are obliged to make reparations, and explain the challenges of proving elements of error that are often obstacles. In coastal cases, the barriers to proof are increasingly complex because damage to public infrastructure is often influenced by many variables, so a legal construct is needed that combines standards of proof, the precautionary principle, and (under certain conditions) a more stringent accountability approach so that recovery does not depend on the community's ability to prove complex technical causality. *This gap* requires strengthening the accountability framework of business actors in relation to the damage to coastal public facilities.<sup>13</sup>

The development of climate policy has also introduced a new dimension in corporate accountability, namely the use of market instruments such as carbon trading which are

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<sup>11</sup> Rozi Syafwan, *Coastal Abrasion Disaster Mitigation Based on Local Wisdom* (Padang: LPPM Bung Hatta University, 2024), pp. 11–13.

<sup>12</sup> S. S. Nugroho, "Collaborative Governance in Abrasion Mitigation ...," (2025): 1–13, pp. 9–11.

<sup>13</sup> "Corporate Legal Responsibility to ...," *JHLG* (2025): 1–18, pp. 11–13.

positioned as a complement to the environmental responsibility regime. The study on civil liability for environmental damage in Indonesia highlights the gaps in enforcement and the importance of a strong monitoring-verification infrastructure so that economic incentives do not become a space for avoidance of recovery obligations. In the coastal context, this correlates with the need to finance the restoration of recurrent damaged public infrastructure: without a clear accountability design, market instruments risk becoming mere "policy ornaments" while the cost of recovery remains borne by the public. *The* latest relevant gap is how to link economic instruments, environmental restoration obligations, and financing coastal public infrastructure restoration into one coherent construction of responsibility.<sup>14</sup>

On the other hand, the government's accountability regime is also developing through maritime regulations that affirm oversight obligations and indemnification provisions in the event of pollution or destruction. Recent studies on government responsibility for the destruction of the marine environment confirm the existence of liability and compensation provisions within the framework of licensing and supervision of certain activities. For coastal public infrastructure, its relevance lies in the chain of oversight obligations: when governments permit or allow activities that increase the risk of damage (e.g. dumping without permits or the construction of installations that alter ocean dynamics), then the construction of responsibility must be able to link the oversight aspect to the consequences of compensation/recovery. *The gap* that often occurs is the separation between "permits" as the administrative realm and "damage" as the disaster realm, even though the two can be interrelated and need to be assessed within a framework of sustainable accountability.<sup>15</sup>

At the level of environmental regulations, Law No. 32 of 2009 affirms the obligation of compensation and recovery for those in charge of businesses/activities that pollute and/or damage the environment. This norm is important because much of the damage to coastal public infrastructure is a continuation of environmental degradation—for example, the loss of natural shields that accelerate abrasion and increase wave energy toward coastal roads or settlements. However, the implementation gap is that environmental restoration norms are

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<sup>14</sup> 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.

<sup>15</sup> 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.

often processed separately from public infrastructure restoration, so that the restoration of public facilities runs without restoration of structural causes. Therefore, this research requires a construction that links the norms of environmental restoration in Law No. 32 of 2009 with the restoration of coastal public infrastructure as part of the restoration of interrelated environmental functions and public services.<sup>16</sup>

In addition to the environmental framework, the problem of damage to coastal public infrastructure is also related to the quality of modern governance—including the general principles of good governance, control of discretion, and legal protection mechanisms for citizens. The literature on state administrative law emphasizes that the development of administrative norms contains the administrative duties and responsibilities of the government, including the dimensions of law enforcement and legal protection in government actions. In the coastal context, this affirmation is important to answer *the* "maintenance accountability" gap: damage to public facilities is often considered a technical domain of a particular service, when in law it can be an indicator of government dysfunction if it is repeated, predictable, and not handled to a reasonable standard. The legal construction under study needs to formulate parameters for when coastal maintenance/supervision failures can be assessed as a violation of government obligations that have implications for recovery responsibility.<sup>17</sup>

In the dimension of coastal law and participation, a number of studies emphasize that the PWP3K Law is the main umbrella for planning, utilization, control, and supervision of coastal areas as well as opening up space for the recognition of the rights of local communities. However, *the gap* that is still strong is the lack of accountability designs that place damage to public infrastructure as an indicator of failure to control and monitor the coast, not just the consequences of nature. When RZWP3K, RTRW, and regional permitting do not enforce coastal boundary protection or ignore the risk of abrasion, damage to public facilities is a consequence that should be traceable for accountability. Thus, this research requires a legal construction that synergizes coastal management norms with the

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<sup>16</sup> Republic of Indonesia, *Law No. 32 of 2009 concerning Environmental Protection and Management* (Jakarta: State Secretariat, 2009), Article 87, pp. 54–55.

<sup>17</sup> Pandapotan Damanik, *State Administrative Law* (Jakarta: Media Publisher Indonesia, 2024), pp. 61–66.

state/business actors' responsibility regime so that sustainable development goals are not reduced to a plan document.<sup>18</sup>

Damage to coastal public infrastructure is also intertwined with the issue of corporate crime and the effectiveness of criminal liability in encouraging compliance. Studies on corporate criminal liability in environmental law emphasize that environmental damage is often triggered by large corporate activities and one of the countermeasures is corporate criminal liability. In the coastal context, criminal liability can be a lever for compliance with prevention and control obligations that have an impact on the safety of public infrastructure. However, the important gap is how to bridge criminal sanctions with concrete recovery of damage to public facilities, as criminal sanctions without a recovery scheme often do not restore lost public services. Therefore, this research places the need to formulate a construction of responsibility that combines criminal, civil, and administrative aspects in an integrated manner for sustainable goals.<sup>19</sup>

On a contemporary empirical scale, research on the impact of climate change on coastal vulnerability shows that sea-level rise and storm intensity increase infrastructure damage and cause significant economic losses, while adaptation efforts (e.g., levees, mangrove restoration, and education) are often constrained by funding and technical support. These findings highlight the latest gaps that legal research needs to address: as risks become more predictable and scientific evidence becomes more available, the standard of due diligence obligations for governments and businesses should increase, including in the design and maintenance of adaptive coastal public infrastructure. If the law does not adapt to such a standard of liability, then repeated damage will continue to be treated as a "natural destiny", and sustainable development loses its operational meaning. Therefore, the background of this research confirms the need to build a legal construction of responsibility that is responsive to the latest scientific evidence while being compatible with the principles of sustainability, intergenerational justice, and protection of the public interest.<sup>20</sup>

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<sup>18</sup> Rofiah, "Local Community-Based Coastal Area Management," *Gudang Jurnal Manajemen Indonesia* (2024): 1–9, pp. 5–7.

<sup>19</sup> M. A. Wijaya, "Corporate Criminal Liability on Environmental Law," *Mulawarman Law Review* (2023): 1–15, pp. 1–4.

<sup>20</sup> A. Trimedianto et al., "Climate Change Impacts on Coastal Vulnerability and Adaptation Readiness: Maritime Perspective," *Golden Ratio of Data in Summary* 4, no. 2 (2024): 302–311, pp. 302–306.

With a sustainable development perspective, this research will formulate a construction that arranges standards for preventive obligations, proof and recovery mechanisms, and accountability designs that ensure that the cost of damage is not constantly socialized to the public, but is allocated fairly to those who have obligations and contributions to risk and damage.

## Problem Formulation

1. How does the current legal framework regulate responsibility for damage to public facilities in coastal areas?
2. How can sustainable development principles strengthen legal accountability in coastal infrastructure protection?

## 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.<sup>21</sup>

The theory of the State of Law (*rechtsstaat* and *rule of law*) is a fundamental foundation in answering how the current legal framework regulates liability for damage to public facilities in coastal areas. In the conception of the state of law, government power is limited and directed by legal norms, so that every action or omission of the government in the implementation of public services can be tested normatively. Damage to coastal public facilities—such as dikes, coastal roads, public docks, and drainage systems—cannot be understood solely as a natural consequence, but as part of the state's responsibility in carrying out protection and public service functions. The state of law requires a close relationship between authority and accountability, so that when the government has the authority to manage coastal areas, there is also a legal obligation to prevent, control, and restore damage to public facilities that have an impact on people's rights.<sup>22</sup>

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<sup>21</sup> 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.

<sup>22</sup> Friedrich Julius Stahl, *Philosophie des Rechts* (Heidelberg: Mohr, 1878), pp. 137–142.

In modern developments, the concept of the rule of law emphasizes not only formal legality, but also the protection of human rights and government accountability. A.V. Dicey emphasized the rule of law and equality before the law as the main feature of *the rule of law*, which means that the government is not immune from lawsuits when there is negligence in the performance of public functions. In the coastal context, the rule of law requires a mechanism that allows the community to sue or demand responsibility for damage to public facilities if there is an element of negligence or policy error. Thus, the existing legal framework must be assessed on the extent to which it provides an instrument of accountability, whether through administrative, civil, or judicial mechanisms.<sup>23</sup>

In Indonesia, the principle of the rule of law is affirmed in Article 1 paragraph (3) of the 1945 Constitution and strengthened through the state's obligation to protect the entire nation and advance public welfare. This conception gave birth to a welfare *state model* that expanded the government's responsibility in the provision and maintenance of public facilities. Damage to public infrastructure in coastal areas due to abrasion, non-adaptive spatial planning, or weak licensing supervision can be interpreted as a failure to fulfill constitutional obligations. Therefore, the theory of the state of law requires that every coastal management authority given to the central and regional governments is accompanied by a standard of responsibility that can be measured and tested legally.<sup>24</sup>

Within the framework of state administrative law, authority is always followed by responsibility (*geen bevoegdheid zonder responsheid*). This principle emphasizes that every government action, including the granting of permits for the use of coastal space, the establishment of zoning plans, or the negligence of the maintenance of public facilities, must be accountable. Damage to coastal public facilities due to policies that are not risk-based or weak supervision can be tested through state administrative justice mechanisms or lawsuits for unlawful acts by the government. Thus, the theory

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

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

of the state of law integrates aspects of authority, discretion, and accountability in a single system that aims to protect the public interest.<sup>25</sup>

Furthermore, the theory of the modern state of law recognizes the importance of the general principles of good governance (AUPB) as a parameter of the legality of administrative actions. In the context of coastal management, the principle of prudence, the principle of prudence, and the principle of accountability are the standards for evaluating policies for infrastructure development and the use of coastal space. If public facilities are damaged due to neglect of environmental feasibility studies or inconsistencies with spatial plans, it can be classified as a violation of the principles of good governance. Therefore, the existing legal framework must be analyzed based on the extent to which it internalizes the AUPB in coastal policy and provides for sanctions for its violations.<sup>26</sup>

From the perspective of environmental law as part of the ecological *rule of law*, responsibility for damage to coastal public facilities is inseparable from the principle of environmental protection. Law No. 32 of 2009 regulates the obligation to recover for environmental damage and opens up room for lawsuits for the government and the community. Since damage to coastal infrastructure is often a consequence of environmental degradation, the environmental responsibility regime must be read systemically with the regime for the protection of public facilities. The ecological law state demands the integration between the restoration of environmental functions and the restoration of public facilities as a unit of legal obligations.<sup>27</sup>

The theory of the state of law is also related to the concept of *state responsibility*. In the doctrine of public law, the state can be held accountable for unlawful acts by its officials or failure to meet protection obligations. In the coastal context, the government's failure to supervise activities that accelerate abrasion or allow development on the coastal border without adequate mitigation can qualify as administrative negligence. Therefore, the legal framework should provide a

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

<sup>26</sup> Ridwan HR, *State Administrative Law* (Jakarta: Rajawali Pers, 2016), pp. 312–320.

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

mechanism for claiming compensation or recovery for damage to public facilities arising from policy or oversight errors.<sup>28</sup>

In the Indonesian legal system, civil liability through Article 1365 of the Civil Code regarding unlawful acts is an important instrument in demanding compensation for damage to public facilities. The state of law requires that there be no void of accountability when actions or omissions cause public harm. Thus, the coastal legal framework must be read together with the civil liability regime so that the restoration of public facilities is not solely charged to the state budget without cost *recovery* efforts for those who contribute to the damage.<sup>29</sup>

In addition, the decentralization of government through Law No. 23 of 2014 concerning Regional Government has implications for the division of authority for the management of coastal areas between the central and regional governments. Within the framework of the state of law, the division of authority must be followed by a clear division of responsibilities. Damage to coastal public facilities is often in the wedge of authority that creates an ambiguity of accountability. Therefore, the theory of the state of law requires legal certainty in determining the subject responsible so that the principles of legality and legal certainty are maintained.<sup>30</sup>

Ultimately, the state of law theory directs that the legal framework governing liability for damage to coastal public facilities must meet three key elements: legality, accountability, and protection of rights. Legality ensures that every coastal management policy has a legal basis; accountability ensures that every authority is accompanied by responsibility; and the protection of rights to ensure that coastal communities obtain guarantees for the sustainability of public facilities. If these three elements have not been effectively integrated in practice, then it can be concluded that there is still a gap between norms and implementation in the Indonesian coastal legal system. Thus, the theory of the state of law becomes an analytical basis for

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<sup>28</sup> Peter Cane, *Administrative Law* (Oxford: Oxford University Press, 2011), pp. 368–372.

<sup>29</sup> R. Subekti, *Principles of Civil Law* (Jakarta: Intermedia, 2003), pp. 145–149.

<sup>30</sup> Ni'matul Huda, *Local Government Law* (Yogyakarta: FH UII Press, 2019), pp. 221–228.

evaluating and reconstructing a framework of responsibility that is more responsive to the damage to public infrastructure in coastal areas.<sup>31</sup>

## 2. Sustainable Development Theory

Sustainable *Development Theory* departs from the idea that development must meet the needs of the current generation without sacrificing the ability of future generations to meet their own needs. In the context of coastal infrastructure protection, this theory demands that the construction of public facilities such as embankments, coastal roads, people's ports, and drainage systems be designed, built, and maintained taking into account the carrying capacity of the environment as well as the long-term climate change risk. Thus, the principle of sustainability expands the meaning of legal accountability: not only being responsible for the damage that has already occurred, but also for failing to anticipate scientifically predictable risks.<sup>32</sup>

One of the key principles of sustainable development is *intergenerational equity*. This principle requires countries and development actors to consider the long-term impact of policies on future generations. In the protection of coastal infrastructure, intergenerational justice strengthens the legal basis for demanding planning standards that are adaptive to sea level rise and abrasion. If the government or business actors ignore these risks, then this negligence not only harms today's society, but also reduces the rights of future generations to safe and functioning public facilities. Therefore, this principle reinforces the argument that legal accountability should cover a longer dimension of time.<sup>33</sup>

The *precautionary principle* is also an important foundation in strengthening legal accountability. This principle states that the absence of scientific certainty should not be used as an excuse to delay preventive measures against potential serious or irreversible damage. In the context of coastal infrastructure, when there is scientific evidence of the risk of abrasion or extreme storms, the government is obliged to

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<sup>31</sup> Satjipto Rahardjo, *Law* (Bandung: Citra Aditya Bakti, 2014), pp. 53–60.

<sup>32</sup> World Commission on Environment and Development, *Our Common Future* (Oxford: Oxford University Press, 1987), pp. 43–46.

<sup>33</sup> Edith Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony, and Intergenerational Equity* (Tokyo: United Nations University, 1989), pp. 25–32.

integrate mitigation measures in spatial planning and the construction of public facilities. If the measure is ignored and damage occurs, then the failure can be considered a breach of the duty of care. Thus, the principle of prudence transforms sustainable development into a standard of juridical evaluation of government actions or omissions.<sup>34</sup>

Furthermore, *the polluter pays principle* emphasizes that the party that causes pollution or environmental damage is obliged to bear the cost of recovery. In the protection of coastal infrastructure, this principle is relevant because the damage to public facilities is often a continuation of ecosystem degradation such as the loss of mangroves or reclamation that alters the dynamics of currents. By internalizing the cost of damage to business actors or parties that contribute to degradation, the law can prevent the practice *of externalization of costs* that impose recovery on the public budget. This principle strengthens accountability by ensuring a fair redress and remedy mechanism.<sup>35</sup>

The principle *of integration* in sustainable development requires environmental protection to be part of the entire development decision-making process. In the coastal context, integration means that spatial planning policies, permits for the use of marine space, and the development of public infrastructure must take into account ecological risks systemically. When this principle is ignored, damage to public facilities is often the consequence of uncoordinated sectoral policies. By making integration a legal standard, sustainable development expands the accountability space as any administrative decision can be tested based on the extent to which it considers environmental aspects and long-term risks.<sup>36</sup>

In the national context, sustainable development has been adopted in the Indonesian legal system through various environmental and spatial regulations. The principle of sustainability in Law No. 32 of 2009 affirms the obligation to protect and manage the environment as the basis for development. This provides legal legitimacy to demand accountability for damage to coastal infrastructure caused by policies or

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

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

<sup>36</sup> Klaus Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (Farnham: Ashgate, 2008), pp. 53–61.

activities that are not environmentally friendly. Thus, sustainable development is not only a policy concept, but also a legal norm that can be used as a testing parameter for government actions.<sup>37</sup>

The principle of public participation also strengthens legal accountability in the protection of coastal infrastructure. Sustainable development recognizes the importance of community involvement in the decision-making process, especially coastal communities that are directly affected. Participation not only increases the legitimacy of policies, but also creates a mechanism of social control over the implementation of development. If the public is given access to information and space to object to risky coastal projects, the potential damage to public facilities can be prevented early. Thus, public participation is a preventive instrument in strengthening accountability.<sup>38</sup>

The principles of transparency and access to *justice* are also an integral part of sustainable development. Coastal infrastructure damaged by unaccountable policies must be the object of legal action by communities or environmental organizations. Without access to dispute resolution mechanisms, the principle of sustainability loses its compulsion. Therefore, the theory of sustainable development strengthens the legal system by demanding effective and affordable procedures to demand the recovery of damage to coastal public facilities.<sup>39</sup>

Furthermore, the concept of *resilience* in sustainable development expands the understanding of coastal infrastructure protection. Infrastructure must not only be built to meet current needs, but it must also be resilient to climate change and disasters. The integration of the concept of resilience in the legal framework reinforces the government's standards of prudence and responsibility in the planning and maintenance of public facilities. Thus, failure to build adaptive infrastructure can be considered a neglect of sustainability obligations.<sup>40</sup>

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<sup>37</sup> Mas Achmad Santosa, *Good Governance and Environmental Law* (Jakarta: ICEL, 2001), pp. 74–82.

<sup>38</sup> Daniel Bodansky, Jutta Brunnée, and Ellen Hey, *The Oxford Handbook of International Environmental Law* (Oxford: Oxford University Press, 2007), pp. 83–90.

<sup>39</sup> Jonas Ebbesson, "Access to Justice in Environmental Matters," *Journal of Environmental Law* 28, no. 1 (2016): 1–17, pp. 5–9.

<sup>40</sup> Brian Walker and David Salt, *Resilience Thinking: Sustaining Ecosystems and People in a Changing World* (Washington, DC: Island Press, 2006), pp. 62–70.

Ultimately, sustainable development theory asserts that legal accountability in coastal infrastructure protection must be preventive, participatory, and restorative. Preventive through the application of the principle of prudence; participatory through public involvement; and restorative through a mechanism of equitable recovery and redress. By integrating these principles into the national legal framework, sustainable development serves as a normative standard that reinforces the accountability of states and business actors for damage to coastal public facilities. Thus, this theory not only explains policy direction, but also provides a juridical foundation for reconstructing legal accountability systems that are more responsive to the challenges of climate change and coastal degradation.<sup>41</sup>

## RESEARCH METHODOLOGY

This study uses normative legal research methods with a *conceptual approach*, a *statute approach*, and a *case approach* to analyze responsibility for coastal public infrastructure damage from a sustainable development perspective. Normative legal research was chosen because the focus of the study lies in the analysis of positive legal norms, principles, and doctrines that govern the authority and responsibilities of the state and business actors in the management of coastal areas. Through this approach, the research examines the consistency, coherence, and adequacy of norms in answering the issue of accountability for damage to public facilities. The conceptual approach is used to examine the theory of the state of law and the theory of sustainable development as the basis for the reconstruction of legal arguments.<sup>42</sup>

The legislative approach is carried out by inventorying and analyzing relevant regulations, including the 1945 Constitution, Law No. 27 of 2007 jo. Law No. 1 of 2014 concerning the Management of Coastal Areas and Small Islands, Law No. 32 of 2009 concerning Environmental Protection and Management, Law No. 23 of 2014 concerning Regional Government, as well as sectoral regulations related to spatial planning and public infrastructure. The analysis was carried out systematically and hierarchically to assess the

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<sup>41</sup> Nico Schrijver, *Development without Destruction: The UN and Global Resource Management* (Bloomington: Indiana University Press, 2010), pp. 37–44.

<sup>42</sup> Peter Mahmud Marzuki, *Legal Research* (Jakarta: Kencana, 2017), pp. 35–41.

relationship between norms of authority, preventive obligations, and administrative, civil, and criminal accountability mechanisms. The interpretation techniques used include grammatical, systematic, and teleological interpretation to understand the intention of lawmakers and their relevance to the protection of coastal infrastructure.<sup>43</sup>

The case approach is used to analyze the practice of accountability for damage to coastal public facilities, either through court rulings, post-disaster recovery policies, and environmental disputes that impact public infrastructure. This approach aims to identify gaps between norms and implementation and evaluate the effectiveness of available legal instruments. Case analysis was carried out by a prescriptive-analytical method to assess whether the application of the law was in line with the principles of the rule of law and sustainable development. Thus, the research does not stop at the normative level, but also considers empirical dynamics as a material for critical evaluation.<sup>44</sup>

The legal materials used in this study consist of primary, secondary, and tertiary legal materials. Primary legal materials include relevant laws and regulations and court decisions; secondary legal materials in the form of textbooks, national and international journals, as well as research results related to sustainable development and coastal law; While tertiary legal materials include legal dictionaries and encyclopedias to clarify conceptual terms. The technique of collecting legal materials is carried out through library *research* with a systematic search of academic literature and legal databases.<sup>45</sup>

The analysis of legal materials is carried out qualitatively by a deductive method, which is to draw conclusions from general principles towards application in concrete cases of damage to coastal infrastructure. The analysis process includes identifying norms, testing consistency between regulations, and evaluating the adequacy of accountability mechanisms within the framework of sustainable development. The results of the analysis are then formulated in the form of prescriptive arguments to offer a more effective reconstruction of the legal accountability model. This approach is expected to produce conceptual and

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<sup>43</sup> Soerjono Soekanto and Sri Mamudji, *Normative Law Research: A Brief Review* (Jakarta: Rajawali Pers, 2015), pp. 13–21.

<sup>44</sup> Johnny Ibrahim, *Theory and Methodology of Normative Legal Research* (Malang: Bayumedia, 2012), pp. 300–307.

<sup>45</sup> Mukti Fajar ND and Yulianto Achmad, *Dualism of Normative and Empirical Law Research* (Yogyakarta: Pustaka Siswa, 2010), pp. 160–166.

normative recommendations that can strengthen coastal infrastructure protection in a sustainable manner.<sup>46</sup>

## RESEARCH RESULTS

### **The current legal framework regulates liability for damage to public facilities in coastal areas**

The legal framework that regulates responsibility for the damage to public facilities in coastal areas from the perspective of the theory of the state of law must start from the constitutional principle that Indonesia is a state of law as affirmed in Article 1 paragraph (3) of the 1945 Constitution. In the theory of the state of law, every authority given to the organs of government is always attached to legal responsibility. Therefore, when the government has the authority to manage coastal areas, including spatial planning, permitting, and public infrastructure development, failure to carry out these functions that results in damage to public facilities can become the object of legal liability. This perspective emphasizes that coastal infrastructure damage is not just a technical or natural event, but must be analyzed within the framework of legality, accountability, and protection of citizens' rights.<sup>47</sup>

Within the framework of administrative law, the government's responsibility for damage to coastal public facilities is related to the principle of *geen bevoegdheid zonder aanspreekbaarheid*, i.e. there is no authority without responsibility. The central and regional governments that have the authority to manage coastal areas based on Law No. 27 of 2007 jo. Law No. 1 of 2014 are obliged to ensure the protection and maintenance of public facilities in the area. In the event of negligence in supervision, control of space utilization, or infrastructure maintenance, administrative responsibility can be requested through available legal mechanisms. This principle shows that the theory of the rule of law provides a conceptual basis for objectively assessing the actions or omissions of the government.<sup>48</sup>

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<sup>46</sup> Sugiyono, *Qualitative, Quantitative, and R&D Research Methods* (Bandung: Alfabeta, 2017), pp. 246–252.

<sup>47</sup> Jimly Asshiddiqie, "The Idea of Rule of Law in Indonesia," *Journal of Law Jus Quia Iustum* 17, no. 3 (2010): 331–350, pp. 335–338.

<sup>48</sup> Philipus M. Hadjon, "On Authority," *Jurisprudence* 16, no. 5 (2001): 401–412, pp. 405–408.

Law No. 27 of 2007 concerning the Management of Coastal Areas and Small Islands regulates the obligation to plan, utilize, and supervise coastal areas through the RZWP3K instrument. From the perspective of the theory of the state of law, this norm is a concrete form of legality that limits and directs government actions. If damage to coastal public facilities occurs due to the use of space that is not in accordance with zoning or weak supervision, then state liability can be constructed based on the violation of these legal obligations. Thus, the existence of coastal regulations is the basis for assessing whether government actions are in accordance with the principles of legality and legal certainty.<sup>49</sup>

In addition to the coastal regime, Law No. 32 of 2009 on Environmental Protection and Management expands the space of responsibility through the principles of prevention and recovery. Damage to coastal public facilities caused by environmental degradation—such as abrasion due to mangrove loss—can be associated with the recovery obligation as stipulated in the articles on *strict liability*. From the perspective of the ecological law state, the integration between environmental protection and the protection of public facilities is important because they are interrelated. These environmental norms strengthen the legal basis for demanding accountability for damage to coastal infrastructure.<sup>50</sup>

The legal framework of responsibility also comes from the civil law regime through Article 1365 of the Civil Code regarding unlawful acts. In the perspective of the theory of the state of law, this norm becomes an instrument to demand compensation for damage to public facilities caused by the actions or negligence of certain parties, including legal entities or corporations operating in coastal areas. This provision provides space for the state or society to file a claim for recovery for losses arising from violations of the law. Thus, liability for damage to public facilities is not only administrative, but can also be civil in nature.<sup>51</sup>

In the context of decentralization, Law No. 23 of 2014 concerning Regional Government divides the authority for marine management between the central and provincial governments. The perspective of the state of law demands that the division of authority must be followed by a clear division of responsibilities. Damage to coastal public facilities is often

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<sup>49</sup> Laely Nurhidayah, "Marine and Coastal Governance in Indonesia," *Asia Pacific Journal of Environmental Law* 20, no. 1 (2017): 1–23, pp. 9–12.

<sup>50</sup> Takdir Rahmadi, "Strict Liability in Indonesian Environmental Law," *Indonesian Environmental Law Journal* 4, no. 2 (2018): 135–156, pp. 140–145.

<sup>51</sup> Herlien Budiono, "The Development of the Doctrine of Unlawful Acts," *Journal of Law & Development* 45, no. 2 (2015): 210–230, pp. 218–223.

within the area of the authority slice which has the potential to cause a vagueness of accountability. Therefore, legal certainty is the main prerequisite for the public to know who is responsible for the maintenance and restoration of public facilities.<sup>52</sup>

From the perspective of spatial planning law, Law No. 26 of 2007 regulates the government's obligation to control the use of space, including coastal areas and coastal borders. Failure to control construction that violates spatial planning can have implications for damage to public facilities due to abrasion or flash flooding. In the theory of the state of law, violations of spatial planning can be the basis for accountability because they show deviations from established norms of legality. Thus, spatial planning law functions as a preventive instrument in the protection of coastal infrastructure.<sup>53</sup>

In addition to the administrative and civil aspects, corporate criminal liability in environmental law is also part of the framework of the state of law. When business activities on the coast cause environmental damage that has an impact on public facilities, criminal liability can be enforced. This instrument affirms that the rule of law provides not only a redress mechanism, but also a sanction mechanism to prevent repeated violations. This approach strengthens the preventive and repressive functions of the law in the protection of coastal public facilities.<sup>54</sup>

From the perspective of disaster law, Law No. 24 of 2007 places the government as the party responsible for the implementation of disaster management, including mitigation and rehabilitation of public infrastructure. In coastal areas that are prone to abrasion and extreme waves, mitigation obligations become part of the country's legal responsibility. The theory of the rule of law demands that these obligations do not stop at the post-disaster response stage, but also include measurable preventive measures. If mitigation is not carried out adequately and damage to public facilities is repeated, it can be considered that administrative negligence occurred.<sup>55</sup>

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<sup>52</sup> Ni'matul Huda, "Asymmetric Decentralization in the Republic of Indonesia," *Journal of the Constitution* 13, no. 4 (2016): 729–748, pp. 736–740.

<sup>53</sup> Bambang Tri Bawono, "Law Enforcement of Spatial Planning in Indonesia," *IUS Journal* 8, no. 3 (2020): 421–436, pp. 425–429.

<sup>54</sup> M. A. Wijaya, "Corporate Criminal Liability in Environmental Law," *Mulawarman Law Review* 7, no. 1 (2022): 15–29, pp. 18–22.

<sup>55</sup> Lilik Mulyadi, "Government Responsibility in Disaster Management," *Indonesian Legislative Journal* 15, no. 2 (2018): 195–208, pp. 199–202.

The legal framework must also be seen in the context of the principles of public accountability that are evolving in modern administrative law. Accountability requires transparency, evaluation, and corrective mechanisms for coastal management policies. In the state of law, accountability is not just a moral obligation, but a legal obligation that can be tested through the courts. Thus, the protection of coastal public facilities must be complemented by effective audit and supervision mechanisms to prevent damage due to improper policies.<sup>56</sup>

The development of the concept of *ecological rule of law* at the international level also affects the understanding of state responsibility for the protection of coastal ecosystems and public infrastructure. This concept emphasizes that the rule of law must be integrated with environmental protection as a condition of sustainability. In the coastal context, the ecological law state requires that development policies do not damage the carrying capacity of the environment which is the natural protector of public facilities. This integration expands the scope of the government's legal responsibilities.<sup>57</sup>

At the practical level, court rulings in environmental disputes are often a reference in assessing liability for public damages. Jurisprudence shows that judges increasingly consider the principles of prudence and sustainability in deciding cases that have an impact on public facilities. This shows that the theory of the rule of law is not static, but rather develops according to the need for public protection. Thus, the role of the judiciary is important in strengthening accountability for damage to coastal infrastructure.<sup>58</sup>

The legal framework of responsibility must also consider the principles of *good governance* that prioritize the effectiveness and integrity of government administration. In coastal management, this principle requires coordination between agencies and community participation to prevent damage to public facilities. An effective state of law requires synergy between legal norms and administrative practices so that coastal infrastructure protection runs optimally.<sup>59</sup>

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<sup>56</sup> Mark Bovens, "Analysing and Assessing Accountability," *European Law Journal* 13, no. 4 (2007): 447–468, pp. 450–454.

<sup>57</sup> Louis J. Kotzé, "The Emergence of Ecological Rule of Law," *Global Environmental Change* 36 (2016): 89–98, pp. 92–95.

<sup>58</sup> Jonas Ebbesson, "The Role of Courts in Environmental Law," *Journal of Environmental Law* 24, no. 1 (2012): 1–17, pp. 6–10.

<sup>59</sup> Klaus Bosselmann, "Sustainable Development Law in the 21st Century," *Sustainability* 8, no. 6 (2016): 1–14, pp. 4–7.

Finally, from the perspective of the theory of the state of law, the entire legal framework governing liability for damage to coastal public facilities should be assessed based on three key parameters: legality, legal certainty, and accountability. Legality ensures that every action has a legal basis; legal certainty ensures clarity in the division of authority and responsibility; while accountability provides a mechanism for recovery and sanctions. If these three parameters are effective, then the protection of coastal infrastructure can be said to be in line with the principle of the rule of law. However, if there is still overlap of authority and weak law enforcement, it is necessary to reconstruct the framework of responsibility to be in line with the ideal of the state of law that protects the public interest in a sustainable manner.<sup>60</sup>

### **Sustainable development principles can strengthen legal accountability in coastal infrastructure protection**

The principles of sustainable development strengthen legal accountability in coastal infrastructure protection by shifting the policy orientation from responsive to preventive and risk-based. From the perspective of *Sustainable Development Theory*, development must not sacrifice the carrying capacity of coastal ecosystems that are the natural protectors of public facilities such as embankments, coastal roads, people's ports, and drainage systems. Thus, sustainability has become a normative standard to assess the legality of government policies and actions in coastal management. Legal accountability extends not only to the damage that has already occurred, but also to the failure to prevent scientifically predictable risks.<sup>61</sup>

The principle of *intergenerational equity* strengthens legal accountability by demanding the protection of coastal infrastructure for future generations. Public infrastructure in coastal areas that are vulnerable to sea level rise and abrasion must be designed adaptively to remain functional in the long term. If development policies ignore scientific projections of climate change and result in repeated damage, it can be considered a

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<sup>60</sup> Brian Tamanaha, "The History and Elements of the Rule of Law," *Singapore Journal of Legal Studies* (2012): 232–247, pp. 240–244.

<sup>61</sup> Klaus Bosselmann, "The Principle of Sustainability: Transforming Law and Governance," *Environmental Law and Governance Review* 8, no. 2 (2016): 1–14, pp. 4–7.

violation of sustainability obligations. This principle makes legal liability trans-temporal, not just reactive to actual damages.<sup>62</sup>

The *precautionary principle* strengthens accountability by establishing an obligation to act before serious or irreparable damage occurs. In the context of coastal infrastructure, the government is obliged to consider the risk of abrasion, extreme storms, and land subsidence in spatial planning and the construction of public facilities. When scientific evidence shows a potential high risk but precautions are not taken, then such failure can become the basis for legal liability. This principle transforms sustainable development into a standard of juridical evaluation of administrative negligence.<sup>63</sup>

The *polluter pays principle* strengthens accountability by internalizing the cost of damage to the party that causes environmental degradation. In coastal infrastructure protection, the destruction of public facilities is often triggered by activities that damage ecosystems such as reclamation or resource exploitation. By applying this principle consistently, the law can prevent the imposition of recovery costs on the public budget. Accountability has become more assertive because the party that contributes to the risk or damage is obliged to bear the financial consequences and recovery.<sup>64</sup>

The principle of *integration* requires environmental protection to be part of the entire development decision-making process. In coastal management, integration means that infrastructure policies must be aligned with spatial planning, ecosystem protection, and disaster mitigation. Failure to integrate often results in the construction of public facilities that are not resistant to coastal dynamics. By making integration a legal standard, sustainable development expands the space of accountability for any sectoral policies that have an impact on public infrastructure.<sup>65</sup>

The principle of public participation strengthens social control over coastal management policies. The involvement of coastal communities in the planning and evaluation process of infrastructure projects increases transparency and prevents high-risk decisions.

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<sup>62</sup> Edith Brown Weiss, "Intergenerational Equity in Environmental Law," *Georgetown Law Journal* 25 (1989): 593–611, pp. 597–602.

<sup>63</sup> Philippe Sands and Jacqueline Peel, "Precautionary Principle," *Journal of Environmental Law* 4, no. 2 (2012): 221–235, pp. 224–229.

<sup>64</sup> OECD, "The Polluter-Pays Principle as It Relates to International Trade," *OECD Legal Studies* (1972): 9–15, pp. 10–12.

<sup>65</sup> Nico Schrijver, "The Evolution of Sustainable Development in International Law," *Recueil des Cours* 329 (2007): 217–412, pp. 284–289.

When participation is ignored and a development project causes damage to public facilities, then legal accountability can be prosecuted based on procedural violations. Thus, sustainable development makes participation an important element in strengthening legal legitimacy and responsibility.<sup>66</sup>

The principles of transparency and access to information also play a role in strengthening legal accountability. Without disclosure of information about coastal risks and development plans, it is difficult for the community to carry out supervision. Transparency allows for scientific evidence-based policy evaluation and prevents maladministration practices. In the context of sustainable development, access to information is a preventive instrument to protect public infrastructure from policies that are not adaptive to climate change.<sup>67</sup>

The concept *of resilience* in sustainable development expands accountability standards by demanding coastal infrastructure that is adaptive to climate change. Infrastructure must not only meet current functions, but also be able to withstand long-term ecological stresses. If the government fails to include elements of resilience in design and maintenance, then the failure can be considered a violation of sustainability obligations. The principle of resilience makes the protection of coastal infrastructure part of the strategy of legal adaptation to global changes.<sup>68</sup>

The principles *of good environmental governance* emphasize institutional coordination and clear division of authority in coastal management. Coastal infrastructure is often affected by asynchronous cross-sectoral policies. By implementing good governance, sustainable development strengthens accountability because each institution has defined roles and responsibilities. A failure of coordination that causes damage to public facilities can be evaluated as a violation of the principles of sustainable governance.<sup>69</sup>

The principle of *ecological justice* expands legal accountability by emphasizing the equitable distribution of development risks and benefits. Coastal communities are often the

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

<sup>67</sup> Daniel Bodansky, "The Role of Transparency in Environmental Governance," *Ecology Law Quarterly* 38, no. 2 (2011): 1–25, pp. 8–12.

<sup>68</sup> Brian Walker and David Salt, "Resilience Thinking and Environmental Governance," *Ecology and Society* 11, no. 1 (2006): 1–10, pp. 3–6.

<sup>69</sup> Louis J. Kotzé, "Global Environmental Governance and the Rule of Law," *Global Environmental Politics* 14, no. 3 (2014): 1–12, pp. 5–8.

group most affected by infrastructure damage due to unsustainable policies. By integrating ecological justice within the legal framework, the protection of coastal infrastructure becomes part of the protection of vulnerable groups. Legal accountability is strengthened because the state is obliged to ensure that policies do not magnify risk inequality.<sup>70</sup>

The *prevention principle* requires the state to prevent damage before it occurs. In the coastal context, these obligations include the mapping of abrasion risks, the arrangement of coastal boundaries, and the restoration of protective ecosystems. If prevention is not carried out adequately and the damage is repeated, then it can be considered as policy negligence. This principle strengthens the preventive function of law in sustainable development.<sup>71</sup>

The principle of common but *differentiated responsibilities* provides the perspective that coastal protection responsibilities can differ according to capacity and risk contribution. In the national context, this principle can be translated in the division of responsibilities between the central government, local governments, and business actors. With this approach, legal accountability becomes more proportionate and realistic.<sup>72</sup>

The restorative principle in sustainable development affirms that restoration must be an integral part of the legal system. The damage to coastal public facilities is not enough to be resolved with administrative sanctions, but must also be followed by the restoration of ecosystems and infrastructure as a whole. Thus, sustainable development strengthens the legal orientation on long-term recovery and sustainability.<sup>73</sup>

Ultimately, the principles of sustainable development—intergenerational justice, prudence, integration, participation, transparency, and restoration—form normative standards that strengthen legal accountability in the protection of coastal infrastructure. By internalizing these principles into regulations and law enforcement practices, the state can ensure that coastal development does not sacrifice sustainability and the public interest. Sustainable development theory thus provides a conceptual and juridical foundation for

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<sup>70</sup> Klaus Bosselmann, "Ecological Justice and Law," *Environmental Politics* 20, no. 2 (2011): 1–16, pp. 9–12.

<sup>71</sup> 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.

<sup>72</sup> Lavanya Rajamani, "Differentiated Responsibility in Environmental Law," *International Affairs* 90, no. 2 (2014): 1–18, pp. 12–15.

<sup>73</sup> Jonas Ebbesson, "Environmental Restoration and Legal Accountability," *Journal of Environmental Law* 30, no. 3 (2018): 1–15, pp. 7–11.

expanding and deepening the system of legal accountability for damage to public facilities in coastal areas.<sup>74</sup>

## CONCLUSION

The results of the study show that:

- 1) The current legal framework has basically provided a normative basis for regulating liability for damage to public facilities in coastal areas through administrative law regimes, environmental law, spatial planning law, civil law, and disaster law. The principle of legality, the principle of authority accompanied by responsibility, and administrative, civil, and criminal accountability mechanisms show that normatively there is no legal vacuum. However, in practice, there are still gaps in the form of overlapping central and regional authorities, weak integration between legal regimes, and the application of accountability principles in supervision and recovery.
- 2) Principles such as *intergenerational equity*, *precautionary principle*, *polluter pays principle*, policy integration, public participation, transparency, and environmental restoration can significantly strengthen legal accountability in coastal infrastructure protection. These principles expand the meaning of responsibility from simply reactive to damage to preventive, adaptive, and long-term oriented. Sustainable development makes the protection of coastal infrastructure a legal obligation that must take into account climate change risks, ecological resilience, and social justice for coastal communities and future generations. By internalizing sustainability principles into national legal frameworks, accountability is not only enforced through sanctions, but also through preventive obligations, governance integration, and comprehensive recovery mechanisms.

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<sup>74</sup> Brian J. Preston, "The Role of Courts in Advancing Sustainable Development," *Journal of Environmental Law* 28, no. 1 (2016): 1–22, pp. 18–21.

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