

Ecological Transition and the Rule of Law: Reconstructing Environmental Governance for a Sustainable Future

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ABSTRACT

The growing climate crisis, environmental degradation, biodiversity loss, and ecological vulnerabilities have increased the urgency of ecological transition in Indonesia. Despite having a relatively comprehensive environmental legal framework, Indonesia continues to face challenges such as institutional fragmentation, inconsistent law enforcement, overlapping authorities, limited enforcement capacity, and the prioritization of economic development over environmental sustainability. This study aims to examine the role of environmental law enforcement in supporting ecological transition and to formulate a framework for reconstructing environmental governance. Using a normative legal method with statutory, conceptual, comparative, and case approaches, the study analyzes constitutional provisions, environmental legislation, international instruments, legal doctrines, and relevant literature. The findings indicate that environmental justice and meaningful public participation remain insufficiently integrated into governance practices. The study argues that ecological transition requires a shift toward sustainability-oriented governance based on constitutional environmental rights, environmental justice, climate resilience, precautionary principles, and intergenerational equity. Therefore, environmental governance reconstruction should prioritize stronger institutional coordination, effective law enforcement, climate policy integration, broader public participation, and the development of an ecological rule of law framework to support Indonesia's sustainable and resilient future.

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A. INTRODUCTION

The twenty-first century has been characterized by increasingly complex environmental challenges, including climate change, biodiversity loss, deforestation, pollution, and natural resource depletion. These issues have intensified global concerns regarding ecological sustainability and encouraged the emergence of ecological transition as a framework for transforming economic, legal, and governance systems toward sustainable development. Ecological transition emphasizes a shift from environmentally harmful practices toward governance models that prioritize ecological integrity, climate resilience, and intergenerational equity. In this context, environmental law and governance serve as essential instruments for directing sustainability-oriented development through participatory natural resource management, the adoption of green technologies, and multi-stakeholder collaboration involving governments, the private sector, and local communities, which have been shown to strengthen environmental protection and policy effectiveness (Abiyya, Husen, Purwandari, Lidiawati, & Safitri, 2025). Furthermore, a holistic approach to environmental law that integrates ecological, social, and economic dimensions, supported by adaptive legal frameworks and cross-sector collaboration, is necessary to respond effectively to evolving environmental challenges and promote sustainable governance (Gaho & Irawati, 2024).

Indonesia occupies a strategic position in global environmental governance due to its rich biodiversity, extensive tropical forests, and vast marine ecosystems, which contribute significantly to national development and global ecological stability. However, rapid industrialization, urbanization, population growth, and intensive resource exploitation have generated serious environmental pressures, including deforestation, pollution, land degradation, and ecosystem destruction. Addressing these challenges requires policy integration that balances economic growth with sustainability objectives, while aligning domestic priorities with global environmental commitments (Bangsawan et al., 2025). In addition, the adoption of environmental innovation technologies plays a crucial role in enhancing community ecological resilience, improving environmental monitoring, and mitigating the impacts of environmental degradation, thereby supporting Indonesia's broader ecological transition agenda (Setiawan, Samith, & Mughits, 2025).

Indonesia has established a relatively comprehensive environmental legal framework. Constitutional provisions recognize the right to a healthy environment and support sustainable economic development, while various regulations govern environmental protection, forestry, mining, fisheries, spatial planning, and climate-related policies. Nevertheless, environmental degradation remains widespread, indicating that the existence of legal norms alone is insufficient to ensure effective environmental protection.

One of the major obstacles lies in the implementation and enforcement of environmental law. Illegal logging, unauthorized mining, pollution, land conversion, and violations of environmental permits continue to occur despite existing regulations. Weak enforcement mechanisms, overlapping institutional authority, inadequate monitoring systems, limited administrative capacity, and competing political-economic interests often reduce the effectiveness of environmental governance. More than 900 environmental crime cases were reported in 2023, reflecting persistent systemic challenges in environmental law enforcement (Tanjung, Andini, Meisandi, Dongoran, & Syamsiah, 2025). In addition, corruption, regulatory loopholes, institutional fragmentation, and limited political commitment further hinder coordinated environmental protection efforts (Romulus, 2025; Sembiring, 2025).

The concept of ecological transition highlights the importance of strengthening environmental law enforcement to promote compliance, accountability, and sustainable behavior. This transition requires a broader transformation from resource-exploitative development approaches toward sustainability-based governance that integrates environmental justice, public participation, climate resilience, and environmental rights protection. Although civil society plays an important role in addressing enforcement gaps, public

participation remains limited, and existing mediation and administrative mechanisms often fail to deliver ecological justice, thereby necessitating stronger regulatory reforms and community empowerment (Hastiyanto, Faried, & Dewi, 2025; Kesek, 2025). Furthermore, international commitments such as the Paris Agreement and the Sustainable Development Goals reinforce the need for governance reforms aligned with global sustainability principles.

Against this background, this study examines the role of environmental law enforcement in supporting ecological transition in Indonesia and explores the reconstruction of environmental governance capable of advancing sustainable development. Using a normative legal approach, the study analyzes constitutional principles, statutory regulations, legal doctrines, and scholarly perspectives to identify institutional and regulatory challenges that hinder ecological transition. The study argues that achieving long-term environmental sustainability requires not only comprehensive environmental regulations but also effective law enforcement, stronger institutional coordination, meaningful public participation, environmental justice, and the development of an ecological rule of law framework.

B. LITERATURE REVIEW

Ecological Transition: Conceptual Foundations and Global Development

The concept of ecological transition has emerged as a key framework in sustainable development, environmental governance, and climate policy, referring to the transformation of economic, social, legal, and political systems to reduce environmental degradation and promote long-term sustainability. Rooted in the principles of sustainable development introduced in *Our Common Future* (1987), ecological transition extends beyond environmental protection by encouraging changes in production systems, energy use, governance, and development practices that balance economic growth, social equity, and environmental integrity. This transition is supported by national and international legal frameworks that promote environmental protection, renewable energy development, and climate change mitigation, while emphasizing the importance of legal instruments in achieving sustainability goals (Jarillo, 2021; TRANZICIJA, 2025). Furthermore, ecological transition requires the integration of ecological economics, systems science, technological innovations such as AI and GIS, and community-based initiatives to strengthen environmental governance and address complex ecological challenges effectively (Lienard, Carbasse, & Poujol, 2022; Röpke, 2019; Sasidhar, 2025). International commitments such as the Paris Agreement have further reinforced ecological transition as a global policy objective requiring coordinated legal, economic, and governance reforms (TRANZICIJA, 2025).

Environmental Governance and Sustainable Development

Environmental governance refers to the institutions, laws, policies, processes, and actors involved in managing environmental resources and addressing environmental challenges to achieve sustainable development. It is based on collaborative approaches involving governments, civil society, the private sector, local communities, and international organizations, and is guided by principles of sustainability, accountability, transparency, public participation, adaptability, and environmental justice. In Indonesia, environmental governance is supported by constitutional and statutory frameworks and operates through multilevel and polycentric institutional arrangements to manage environmental resources and conflicts effectively (Paavola, 2023). However, its effectiveness continues to face challenges, including socio-economic disparities, environmental degradation, weak intergovernmental coordination, limited law enforcement, and conflicts of interest that reduce regulatory effectiveness (Iskandar, Pratiwi, Budiman, Saedi, & Santoso, 2025; Pranyoto, Ekowanti, Soenyono, & Suhardono, 2024; Sitorus & Sinaga, 2024). Therefore, strengthening stakeholder participation, integrating traditional ecological knowledge with modern environmental management, and improving institutional capacity are essential to support sustainable development and achieve the Sustainable Development Goals (SDGs) (Pranyoto et al., 2024).

Environmental Law Enforcement: Theoretical Perspectives

Environmental law enforcement is a fundamental component of environmental governance because environmental regulations can only achieve their objectives when effectively implemented and enforced. Drawing on deterrence and compliance theories, environmental law enforcement combines sanctions, monitoring, education, incentives, and stakeholder engagement to promote compliance and achieve tangible environmental outcomes. Enforcement is carried out through administrative, civil, and criminal mechanisms, and its effectiveness depends on regulatory clarity, institutional capacity, judicial independence, political commitment, and public awareness. In Indonesia, effective enforcement is supported by regulatory frameworks such as Law No. 32 of 2009, which emphasizes environmental protection and the need for stronger legal instruments to address environmental challenges (DINI, RATU, & UBAIDILLAH, 2024; Silalahi & Indra, 2025). However, enforcement efforts continue to face obstacles, including overlapping institutional authority, limited resources, corruption, and inadequate technical capacity, which reduce the effectiveness of law enforcement agencies and environmental governance (Silalahi & Indra, 2025; Yari et al., 2025). Therefore, strengthening environmental law enforcement requires integrated strategies involving institutional accountability, technological innovation, and meaningful public participation to improve compliance and support sustainable environmental governance (DINI et al., 2024; Silalahi & Indra, 2025; Yari et al., 2025).

Environmental Justice and Rights-Based Environmental Governance

Environmental justice is a fundamental principle of environmental governance that seeks to ensure the fair distribution of environmental benefits and burdens, equal protection from environmental risks, and meaningful participation in environmental decision-making. It emphasizes distributive, procedural, and recognition justice, particularly for indigenous, marginalized, and vulnerable communities, while promoting fair treatment regardless of race, ethnicity, or socioeconomic status. Emerging from concerns over historical inequalities and environmental burdens disproportionately experienced by marginalized groups, environmental justice has evolved into a global movement advocating equitable access to environmental resources and protection from ecological harm (M. A. Ali & Kamraju, 2023; Rodríguez-Labajos & Özkaynak, 2017). Closely linked to human rights, it recognizes that environmental degradation can threaten rights to health, life, water, food, housing, and cultural identity, thereby requiring governments to ensure transparency, public participation, accountability, and effective remedies for environmental violations as part of sustainable environmental governance (Humphrey, 2007; Rodríguez-Labajos & Özkaynak, 2017).

Ecological Governance and the Reconstruction of Environmental Law

Ecological governance is an environmental management approach that places ecological sustainability at the center of governance systems by recognizing ecological integrity as essential for long-term social and economic well-being. It is grounded in the principles of interconnected human–nature systems, precautionary decision-making, resilience, adaptability, intergenerational equity, and the integration of scientific knowledge into policymaking. Ecological governance emphasizes the need to prioritize ecosystem health through sustainable natural resource management, strengthen environmental rights, improve regulatory coherence, and promote collaboration among governments, civil society, and the private sector to address increasingly complex environmental challenges (Sutikno & Kurniasih, 2025). Furthermore, effective ecological governance requires adaptive institutions capable of responding to changing environmental conditions, ensuring intergenerational equity, and utilizing evidence-based policymaking through the incorporation of scientific research into environmental regulations and decision-making processes (Mohammad, Sutjahjo, Effendi, Sitanggang, & Sasongko, 2025; Purniawati, Kasana, & Rodiyah, 2020; Triyanti, Indrawan, Nurhidayah, & Marfai, 2023). In the context of ecological transition, these legal and institutional reforms are crucial for promoting sustainable development, environmental

justice, climate resilience, and long-term environmental protection, particularly in ecologically significant and vulnerable countries such as Indonesia.

C. RESEARCH METHOD

This study employs a normative legal research method to examine the relationship between ecological transition and environmental law enforcement in Indonesia and to formulate a framework for reconstructing environmental governance that supports sustainable development. As a doctrinal legal study, the research focuses on the analysis of legal norms, legal principles, statutory regulations, judicial interpretations, and legal doctrines rather than empirical field data. The study adopts both analytical and prescriptive approaches, enabling an evaluation of existing environmental governance arrangements while proposing legal reforms to strengthen sustainability-oriented governance. To achieve these objectives, the research utilizes statutory, conceptual, comparative, and case approaches. These approaches facilitate the examination of constitutional provisions, environmental legislation, sustainability theories, environmental justice principles, comparative governance models, and selected environmental cases relevant to ecological transition.

The study relies on primary, secondary, and tertiary legal materials. Primary legal materials include constitutional provisions, environmental legislation, government regulations, and international environmental instruments such as the Rio Declaration, the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change, the Paris Agreement, and the Sustainable Development Goals. Secondary legal materials consist of books, academic journal articles, research reports, legal commentaries, and scholarly analyses related to environmental governance, ecological transition, sustainability, and environmental law enforcement. Tertiary legal materials include legal dictionaries, encyclopedias, legal databases, and official government publications that support the interpretation and organization of legal concepts.

Legal materials were collected through library research by systematically reviewing legislation, judicial decisions, academic literature, international legal documents, and environmental policy reports. The collected materials were analyzed using qualitative legal analysis through several stages, including legal inventory, legal interpretation, normative evaluation, comparative analysis, and prescriptive formulation. This analytical process was undertaken to assess the adequacy of Indonesia's environmental governance framework, identify regulatory and institutional weaknesses, compare domestic practices with international standards, and formulate recommendations for strengthening environmental law enforcement and ecological governance in support of sustainable development.

D. RESULTS AND DISCUSSION

The Urgency of Ecological Transition in Indonesia

The findings indicate that Indonesia is at a critical stage in addressing environmental challenges that threaten long-term sustainability. Despite its abundant natural resources and rich biodiversity, environmental degradation continues due to unsustainable development practices, intensive resource exploitation, and weak environmental governance. The increasing occurrence of climate-related disasters, pollution, biodiversity loss, and ecosystem degradation demonstrates the limitations of development models that prioritize short-term economic growth over ecological sustainability. Historically, sectors such as mining, forestry, plantations, and energy production have contributed significantly to economic development while simultaneously generating environmental costs, including deforestation, land conversion, habitat destruction, and rising carbon emissions.

The study finds that ecological transition offers a strategic framework for addressing these challenges through systemic transformation across legal, institutional, economic, and social dimensions. Unlike conventional environmental management approaches, ecological transition requires a shift from

resource-exploitative governance toward sustainability-oriented governance that recognizes ecological integrity as a core component of development. In this context, environmental law plays a crucial role in regulating behavior, promoting accountability, ensuring compliance, and protecting environmental rights. However, the effectiveness of environmental law enforcement remains constrained by institutional fragmentation, overlapping authorities, limited enforcement capacity, regulatory ambiguity, inadequate supervision, and low levels of public participation (Iskandar et al., 2025; Kesek, 2025; Romulus, 2025).

Furthermore, the study reveals that Indonesia already possesses a relatively strong legal foundation for ecological transition through constitutional guarantees of the right to a healthy environment and environmental legislation that incorporates principles of sustainability, precaution, public participation, and environmental responsibility. Nevertheless, implementation challenges continue to hinder the realization of these principles. Civil society organizations have played an important role in bridging enforcement gaps and promoting environmental justice (Kesek, 2025), while strengthening institutional capacity, harmonizing regulatory frameworks, applying restorative justice approaches, and utilizing technology-based monitoring systems are essential for improving environmental law enforcement and supporting long-term sustainability (Iskandar et al., 2025; Tanjung et al., 2025).

Environmental Governance Framework in Indonesia: Strengths and Limitations

The analysis shows that Indonesia has established a relatively comprehensive environmental governance framework supported by constitutional recognition of environmental rights, environmental legislation, administrative institutions, judicial mechanisms, and environmental licensing systems. Law No. 32 of 2009 concerning Environmental Protection and Management serves as the primary legal instrument, incorporating principles of sustainable development, precaution, environmental responsibility, public participation, and environmental democracy. Environmental governance is further implemented through national and regional institutions, environmental impact assessment mechanisms, environmental permits, and monitoring systems designed to prevent environmental degradation and promote sustainable resource management.

Despite these legal and institutional foundations, the study identifies several significant weaknesses within the existing governance framework. Institutional fragmentation remains a major challenge, as overlapping authorities among governmental agencies create coordination problems, regulatory inconsistencies, and uncertainty in policy implementation (Kesek, 2025; Romulus, 2025). Weak inter-agency coordination also reduces the effectiveness of environmental law enforcement and compliance efforts (Susanto, Baralaska, & Jaelani, 2024). Furthermore, environmental considerations often remain secondary to economic development priorities, particularly in infrastructure, mining, and industrial projects, while policy implementation is frequently hindered by regulatory gaps and resistance from industry actors (Romulus, 2025).

The findings also reveal substantial disparities in institutional capacity across regions, where local governments often lack adequate resources, technical expertise, and administrative capabilities to effectively implement environmental regulations (Kesek, 2025; Susanto et al., 2024). In addition, environmental governance mechanisms tend to emphasize procedural compliance, such as permits and environmental impact assessments, rather than ensuring substantive environmental protection outcomes (Kurniawan, Tratama, & Mulyani, 2025; Mohammad et al., 2025). Consequently, although Indonesia possesses an extensive environmental governance framework, these structural and institutional weaknesses continue to constrain its effectiveness in addressing contemporary environmental and ecological challenges.

Challenges in Environmental Law Enforcement

One of the most significant findings of this study is that environmental law enforcement remains a major challenge in Indonesia. Despite the existence of environmental regulations, violations such as illegal logging, unauthorized mining, pollution, waste mismanagement, and land conversion continue to occur

across various sectors, reflecting a substantial gap between legal requirements and actual compliance. In many cases, environmental obligations are viewed as administrative burdens rather than substantive legal responsibilities, while weak monitoring systems further reduce incentives for compliance and accountability.

The study also finds that limited institutional capacity significantly undermines enforcement effectiveness. Environmental enforcement agencies frequently face shortages of personnel, funding, technical expertise, and monitoring technology, which hinder their ability to address environmental violations effectively (Tanjung et al., 2025). These challenges are compounded by overlapping regulatory authority, institutional fragmentation, and weak inter-agency coordination, creating uncertainty and inefficiencies in environmental management and enforcement (Kesek, 2025). Consequently, enforcement efforts often struggle to address violations involving powerful corporate actors with substantial financial and technical resources.

In addition, environmental law enforcement is frequently influenced by political and economic interests that may weaken regulatory actions and reduce accountability. Access to environmental justice remains limited due to complex scientific evidence requirements, lengthy judicial processes, high litigation costs, and inconsistencies in judicial interpretation of environmental rights and legal standards (Yunita et al., 2024). Therefore, strengthening environmental law enforcement requires comprehensive institutional reforms, including stronger inter-agency coordination, greater community participation, enhanced judicial capacity, and the utilization of technologies such as artificial intelligence and big data for environmental monitoring and compliance (Suryawan, Aryana, Suryadi, Krsna, & Guterres, 2025; Tanjung et al., 2025).

Environmental Justice as a Foundation for Sustainable Governance

The study finds that environmental justice is a fundamental component of ecological transition and sustainable governance because environmental degradation often disproportionately affects vulnerable groups, including indigenous peoples, coastal communities, rural populations, and economically disadvantaged groups. Although Indonesia's constitutional framework recognizes environmental rights and provides an important legal foundation for environmental justice, the implementation of these rights remains uneven, particularly regarding the meaningful participation of marginalized communities in environmental decision-making processes.

The findings highlight the importance of strengthening distributive justice, procedural justice, and access to justice by ensuring the fair distribution of environmental benefits and burdens, preventing disproportionate environmental risks, guaranteeing meaningful public participation, and providing accessible and effective legal remedies. Strengthening these dimensions is essential for promoting fairness, accountability, and more sustainable environmental governance outcomes.

Reconstructing Environmental Governance for a Sustainable Future

Based on the findings, achieving ecological transition in Indonesia requires a comprehensive reconstruction of environmental governance through sustainability-centered approaches that place ecological integrity at the core of development. This includes strengthening constitutional environmental rights, improving institutional coordination, enhancing environmental law enforcement through greater capacity and technological innovation, integrating climate governance across sectors, and expanding meaningful public participation. Guided by principles of sustainability, precaution, intergenerational equity, ecosystem integrity, climate resilience, environmental justice, and public accountability, these reforms are essential for addressing complex environmental challenges and advancing sustainable development.

Toward an Ecological Rule of Law in Indonesia

The findings indicate that Indonesia's ecological transition depends on the development of an ecological rule of law that integrates environmental sustainability into governance, public administration,

judicial decision-making, and economic regulation, making environmental protection a central objective rather than a secondary policy concern. This requires strong institutions, transparent governance, effective law enforcement, meaningful public participation, and a constitutional commitment to sustainability, while shifting from reactive environmental management toward preventive and adaptive governance. Through stronger environmental law enforcement, greater environmental justice, enhanced constitutional accountability, and sustainability-oriented governance, Indonesia can build a more resilient environmental governance system capable of ensuring long-term environmental protection and sustainable development for present and future generations.

E. CONCLUSION

The study concludes that ecological transition is an urgent necessity for Indonesia in addressing environmental degradation, climate change, biodiversity loss, and increasing ecological risks. Although Indonesia has established a relatively comprehensive environmental legal framework, its effectiveness remains constrained by institutional fragmentation, overlapping regulatory authority, limited enforcement capacity, weak compliance mechanisms, and the continued prioritization of economic growth over environmental sustainability. The findings further highlight that environmental justice, meaningful public participation, equitable distribution of environmental benefits and burdens, and access to legal remedies are essential components of sustainable governance. Therefore, the reconstruction of environmental governance should be directed toward the development of an ecological rule of law that integrates sustainability, environmental justice, climate resilience, precautionary principles, intergenerational equity, public accountability, and effective law enforcement. Through stronger institutional coordination, improved regulatory coherence, enhanced environmental monitoring, and broader public participation, Indonesia can transform its governance system into a sustainability-oriented framework capable of protecting ecological integrity, promoting social justice, and ensuring a sustainable future for present and future generations.

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