

(Research/Review) Article

## The Effectiveness of Enforcing the Polluter Pays Principle as an Ecological Restoration Mechanism in Environmental Disputes in Indonesia

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**Abstract:** Environmental pollution and degradation remain serious issues in Indonesia, causing significant impacts on ecosystems and the social life of communities. One of the fundamental principles in environmental law aimed at ensuring ecological restoration is the Polluter Pays Principle (PPP), which obliges polluters to bear all costs arising from environmental pollution or damage caused by their activities. This study aims to analyze the effectiveness of enforcing the Polluter Pays Principle as a mechanism for ecological restoration in resolving environmental disputes in Indonesia. The research employs a normative legal research method using statutory and conceptual approaches. The findings indicate that although the Polluter Pays Principle has been normatively adopted in Law Number 32 of 2009 on Environmental Protection and Management, its implementation in practice remains suboptimal. Major obstacles include weak law enforcement, power imbalances between business actors and affected communities, lack of transparency in the use of compensation funds, and limited public participation in environmental restoration processes. Therefore, strengthening regulatory frameworks, enhancing the capacity of law enforcement institutions, and adopting a restorative justice approach are necessary to ensure that the Polluter Pays Principle functions effectively in achieving ecological restoration and environmental justice in Indonesia.

**Keywords:** Ecological Restoration; Environmental Disputes; Environmental Justice; Environmental Law Enforcement; Polluter Pays Principle.

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### 1. Introduction

Environmental damage and pollution are global issues that have a widespread impact on the sustainability of ecosystems and the quality of human life. In Indonesia, the increase in industrial, mining, and natural resource exploitation activities is often not balanced with adequate environmental management, leading to various environmental disputes. The impact of pollution is not only ecological, but also social and economic, especially for communities living in the affected areas.

In the context of environmental law, the state has an obligation to ensure the protection and sustainable management of the environment. One important principle that is recognized internationally and nationally is the Polluter Pays Principle (PPP), which asserts that parties that cause pollution or environmental damage are obliged to bear all costs arising from their actions. This principle aims to prevent the transfer of the burden of environmental damage to the community or the state, while encouraging business actors to be more responsible in carrying out their activities.

In Indonesia, the PPP has been adopted in Law No. 32 of 2009 concerning Environmental Protection and Management. However, in practice, the application of this principle still faces various obstacles, ranging from weak law enforcement, an imbalance between businesses and the community, to environmental restoration that has not been carried out optimally. Environmental disputes often end with financial penalties without ensuring comprehensive ecological restoration.

Environmental degradation and pollution have evolved into multidimensional global challenges that directly threaten ecological resilience, public health, and socio-economic stability, particularly in developing countries with intensive natural resource exploitation such as Indonesia. Rapid industrialization, large-scale mining operations, and expansive extractive activities have significantly increased environmental pressures, often without being accompanied by proportionate environmental governance and mitigation mechanisms, a condition that has been widely discussed in Indonesian environmental law scholarship (Nazah et al., 2025). The resulting environmental harm manifests not only in ecosystem degradation but also in social dislocation, health risks, and economic vulnerability for local communities whose livelihoods depend on environmental integrity, as emphasized by Gaman and Tuasikal (2025) in their analysis of sustainable development-oriented dispute resolution. These impacts frequently culminate in environmental disputes, reflecting systemic governance failures rather than isolated incidents, a perspective reinforced by Ramadhan and Salmi (2024) in their discussion of restorative justice in environmental cases. Consequently, environmental pollution in Indonesia must be understood as a structural legal and policy issue that demands principled accountability mechanisms rather than ad hoc remedial responses.

Within the framework of environmental law, the state bears a constitutional and moral obligation to ensure environmental protection and sustainable management, an obligation that is operationalized through internationally recognized legal principles. Among these principles, the Polluter Pays Principle (PPP) occupies a central position, asserting that actors who cause pollution or environmental damage must internalize the full costs of prevention, control, remediation, and compensation, a normative stance highlighted by Nugroho et al. (2024) in the context of criminal liability for business actors. By embedding responsibility directly on polluters, the PPP seeks to prevent the externalization of environmental costs onto society or the state, while simultaneously reshaping economic incentives toward environmentally responsible behavior, as analyzed by Pratama and Mumpuni (2025) in their comparative study on carbon taxation. The principle also functions as a corrective justice mechanism, ensuring that environmental harm is addressed at its source rather than subsidized by public resources, an argument consistently advanced in Indonesian environmental legal discourse (Ramadhan & Salmi, 2024). Therefore, the PPP is not merely a technical rule of liability, but a foundational doctrine aimed at aligning economic development with environmental justice and sustainability.

In Indonesia, the Polluter Pays Principle has been formally incorporated into the national legal system through Law No. 32 of 2009 on Environmental Protection and Management, which establishes polluter responsibility across administrative, civil, and criminal domains. Despite this normative recognition, empirical and doctrinal studies demonstrate that the enforcement of the PPP remains fragmented and inconsistent, particularly when confronted with powerful corporate actors and complex evidentiary standards, as noted by Alfisyahr (2025) in his analysis of strict liability in environmental disputes. Weak law enforcement capacity, regulatory capture, and asymmetrical power relations between business entities and affected communities often undermine the realization of substantive environmental accountability, a concern echoed by Nugroho et al. (2024). Moreover, environmental disputes in practice frequently conclude with financial penalties or compensation schemes that lack effective monitoring and fail to guarantee actual ecological restoration, an outcome critically examined by Ramadhan and Salmi (2024). This gap between legal norms and enforcement practice reveals a systemic failure to translate the PPP from a declaratory principle into a functional instrument of ecological recovery.

Given these persistent shortcomings, scholarly attention has increasingly focused on reassessing the effectiveness of enforcing the Polluter Pays Principle as a mechanism for ecological restoration rather than merely a punitive tool. An effective PPP enforcement framework must not only impose liability but also ensure that restoration outcomes are measurable, participatory, and aligned with community needs, as argued by Gaman and Tuasikal (2025) through alternative dispute resolution perspectives. Integrating restorative justice approaches into environmental dispute resolution has been proposed as a means to rebalance power relations, enhance community participation, and ensure that compensation directly contributes to ecological and social recovery, a proposition strongly supported by Ramadhan and Salmi (2024). Furthermore, aligning PPP enforcement with broader climate

mitigation and sustainability goals, as discussed by Nazah et al. (2025), underscores its strategic relevance beyond individual cases. Accordingly, this study is essential to critically examine the effectiveness, obstacles, and reform pathways of PPP enforcement in Indonesia, with the ultimate aim of strengthening environmental justice and long-term ecosystem sustainability.

Given these conditions, it is important to conduct this study to examine the effectiveness of enforcing the Polluter Pays Principle as a mechanism for ecological restoration in environmental disputes in Indonesia, as well as to identify obstacles and improvement efforts so that this principle can truly realize environmental justice and ecosystem sustainability.

## **2. Preliminaries or Related Work or Literature Review**

### **2.1. Corporate Environmental Liability under Indonesian Environmental Law**

Corporate environmental liability constitutes a central theoretical foundation in examining the enforcement of the Polluter Pays Principle within Indonesia's environmental legal system. Law No. 32 of 2009 establishes that corporations, as legal subjects, bear direct responsibility for environmental pollution and degradation arising from their business activities, regardless of whether such harm is intentional or negligent, a position systematically analyzed by Hasibuan et al. (2025) in their study on corporate accountability. This framework reflects a shift from individual fault-based liability toward an institutional responsibility model, recognizing corporations as dominant actors with significant environmental impact. From a theoretical perspective, corporate liability serves not only as a punitive mechanism but also as a preventive instrument designed to internalize environmental risks into corporate decision-making processes, as emphasized by Firdaus (2021). Consequently, corporate environmental liability provides the doctrinal basis for obligating business actors to finance ecological restoration and compensation, thereby reinforcing the normative logic of the Polluter Pays Principle in environmental dispute resolution.

### **2.2. The Polluter Pays Principle as a Legal Doctrine of Environmental Responsibility**

The Polluter Pays Principle (PPP) represents a core doctrine in environmental law that mandates polluters to bear the full costs of pollution prevention, control, and remediation, ensuring that environmental harm is not externalized to society or the state. In the Indonesian legal context, the PPP has been conceptualized as both a legal and ethical principle that integrates economic rationality with environmental justice, as elaborated by Purwendah (2021) in her analysis of its position within the national legal system. Theoretically, the PPP functions as a mechanism for internalizing environmental externalities, compelling business actors to incorporate environmental costs into their operational expenditures, a rationale further developed by Ali et al. (2023) in relation to wastewater pollution standards. This principle also reinforces legal certainty by providing a clear normative basis for imposing compensation and restoration obligations on polluters, while simultaneously serving as a deterrent against future violations. As such, the PPP operates as a foundational doctrine that links liability, restoration, and sustainability within environmental governance.

### **2.3. Jurisprudential Approaches to Environmental Disputes and Ecological Restoration**

Judicial interpretation and jurisprudence play a crucial theoretical role in shaping the practical application of environmental liability and the Polluter Pays Principle in Indonesia. Environmental dispute jurisprudence demonstrates how courts translate abstract legal principles into concrete obligations, particularly in cases involving large-scale mining and industrial activities that result in significant ecological damage. Gaol et al. (2025) highlight that Indonesian courts increasingly recognize environmental harm as a violation of public rights, thereby legitimizing claims for compensation and restoration beyond mere administrative sanctions. From a theoretical standpoint, jurisprudence serves as a bridge between normative environmental principles and their enforcement, clarifying standards of proof, liability thresholds, and the scope of restoration obligations. Accordingly, judicial practice becomes a critical determinant in assessing whether the Polluter Pays Principle functions merely as a declaratory norm or as an effective mechanism for ecological restoration and environmental justice in Indonesia.

## **3. Materials and Method**

This study uses a normative legal research method. The approaches used include the statute approach and the conceptual approach. The statute approach was conducted by examining various laws and regulations related to the Polluter Pays Principle, particularly Law No. 32 of 2009 concerning Environmental Protection and Management and its implementing regulations.

The conceptual approach was used to examine the concepts, principles, and theories related to PPP, ecological restoration, and environmental justice. The legal materials used consisted of primary legal materials in the form of laws and regulations and court decisions related to environmental disputes, as well as secondary legal materials in the form of books, scientific journals, and environmental law literature. The analysis was conducted qualitatively by drawing deductive conclusions, namely from general legal provisions to their application in practice.

## 4. Results and Discussion

### 4.1. Conceptual Basis of the Polluter Pays Principle and Its Relevance to Ecological Restoration

The Polluter Pays Principle (PPP) is a fundamental principle in environmental law that affirms that parties responsible for pollution or environmental damage must bear all costs arising from their actions, including the costs of prevention, control, remediation, and compensation for the environmental impacts caused. This principle emerged as a response to various phenomena in which the costs of environmental damage were often borne by society or the government rather than by the polluters themselves.

Philosophically, the PPP is grounded in the principles of distributive justice and ethical responsibility. It emphasizes that every individual or business entity that causes negative impacts on the environment must be morally and legally accountable for the losses incurred, so as to prevent the shifting of costs to other parties or future generations. In the context of ecological restoration, the PPP ensures that environmental restoration efforts do not become solely a public burden, but rather constitute a direct obligation of the polluter (Ilmiah & Pendidikan, 2025).

From an economic perspective, the PPP functions as a mechanism for the internalization of externality costs, meaning it is a way to ensure that individuals or companies engaged in economic activities directly experience the consequences of the impacts they generate, whether positive or negative, thereby encouraging greater responsibility. Through this mechanism, the PPP promotes economic efficiency and alters incentives for business actors to more carefully consider environmental impacts in their production processes. Funds collected under the PPP can be utilized for restoration activities, monitoring, and strengthening the capacity for ecosystem recovery (Kurnia et al., 2023).

In the legal context, the PPP serves as a foundation for more equitable and effective enforcement of environmental law. This principle establishes legal obligations for polluters to pay the costs of prevention, control, and environmental restoration, as well as to provide compensation to affected communities. In Indonesia, the PPP is regulated under Law No. 32 of 2009 on Environmental Protection and Management, which stipulates that polluters are required to restore damaged environments and provide compensation to victims (Purwendah & E. M. E., 2021).

The implementation of the PPP in Indonesia is carried out through various legal instruments, such as compensation obligations, pollution charges, and administrative or criminal sanctions for parties that violate environmental regulations. In practice, the PPP also encourages companies to allocate dedicated funds for environmental remediation activities and the restoration of damaged ecosystems. The PPP is highly relevant to ecological restoration because it guarantees the availability of funds for ecological recovery directly from polluters. Consequently, environmental restoration efforts no longer rely entirely on government budgets but are supported by resources from those responsible for causing the damage.

The PPP also encourages business actors to take preventive and mitigation measures against environmental damage at an early stage. With the obligation to bear remediation costs, business actors are more cautious in conducting activities that may potentially harm the environment, thereby preventing more severe damage in the future. The PPP provides a strong legal basis for claiming compensation and the restoration of damaged environments, as well as for protecting the rights of affected communities. This principle ensures that communities who become victims of environmental damage receive fair compensation and that their environments are restored in accordance with established standards (Muhdar, 2009).

The PPP is not merely a legal and economic principle, but also a strong ethical foundation for realizing sustainable and equitable ecological restoration. This principle underscores the importance of shared responsibility and justice in addressing environmental issues. Thus, the PPP becomes a crucial instrument in promoting environmental sustainability and achieving social justice, both in the context of pollution prevention and the restoration of degraded ecosystems.

The Polluter Pays Principle (PPP) constitutes a cornerstone of modern environmental law by affirming that any party responsible for environmental pollution or degradation must bear the full spectrum of costs arising from its actions, including prevention, mitigation, remediation, and compensation measures, a normative position strongly articulated in Indonesian legal scholarship by Firdaus (2021). Conceptually, the PPP emerged as a corrective response to historical practices in which environmental losses were externalized to the public or absorbed by the state, thereby undermining fairness and environmental accountability, as discussed in the context of corporate responsibility by Ilmiah and Pendidikan (2025). By reallocating environmental costs back to polluters, the PPP seeks to dismantle systemic injustices that allow economic actors to profit while society bears ecological harm, a concern that remains highly relevant in cases of industrial and extractive pollution in Indonesia (Christallago et al., 2020). Within ecological restoration discourse, the PPP redefines restoration not as a discretionary policy choice but as a mandatory legal consequence of environmental harm, ensuring that recovery efforts are directly linked to liability (Kurnia et al., 2023). Accordingly, the principle provides a conceptual bridge between environmental damage and restorative obligations, reinforcing the notion that ecological recovery is inseparable from legal responsibility (Ramadhan & S., 2024).

From a philosophical perspective, the PPP is deeply rooted in distributive justice and ethical accountability, emphasizing that environmental burdens should be allocated to those who generate risks and damage rather than to innocent communities or future generations, as elaborated by Firdaus (2021). This ethical foundation aligns closely with the concept of intergenerational justice, whereby current polluters are required to restore ecological conditions so as not to compromise the rights of future populations, a theme that resonates strongly in restorative justice-oriented environmental law debates (Ramadhan & S., 2024). Ilmiah and Pendidikan (2025) further explain that the PPP embodies corporate moral responsibility by positioning environmental restoration as an inherent obligation of business entities, not merely a regulatory sanction. In the context of ecological restoration, this ethical orientation ensures that restoration efforts address substantive ecological harm rather than serving as symbolic or procedural compliance exercises (Christallago et al., 2020). Thus, the PPP functions as an ethical compass that integrates legal accountability with broader notions of social and ecological justice.

Economically, the Polluter Pays Principle operates as a mechanism for the internalization of environmental externalities, compelling polluters to incorporate the true environmental costs of their activities into production and operational decisions, as demonstrated in empirical analyses by Kurnia et al. (2023). By internalizing these costs, the PPP alters incentive structures, encouraging business actors to adopt cleaner technologies, improve waste management, and invest in preventive measures to avoid higher remediation expenses, a dynamic also observed in hazardous and toxic waste (B3) pollution cases analyzed by Larasati and Purwendah (2022). Funds derived from PPP-based compensation and liability schemes can be strategically allocated to ecological restoration programs, long-term environmental monitoring, and ecosystem rehabilitation initiatives, thereby strengthening the overall capacity for environmental recovery (Christallago et al., 2020). This economic rationale reinforces the efficiency argument of the PPP, as restoration costs are borne by those best positioned to prevent damage in the first place (Firdaus, 2021). Consequently, the PPP not only promotes economic efficiency but also ensures that ecological restoration is financially sustainable and institutionally feasible.

In the legal context, the Polluter Pays Principle provides a doctrinal foundation for more effective enforcement of environmental law by clearly establishing the obligation of polluters to restore damaged environments and compensate affected communities, as reflected in Indonesian practice examined by Kurnia et al. (2023). Legal instruments implementing the PPP, including civil liability, administrative sanctions, and criminal responsibility, are designed to ensure that restoration is not reduced to monetary penalties devoid of ecological impact, a challenge highlighted in pollution and marine contamination cases by Christallago et al. (2020). Ramadhan and S. (2024) argue that integrating restorative justice approaches within PPP enforcement strengthens its relevance to ecological restoration by prioritizing environmental recovery and community involvement over purely punitive outcomes. Moreover, the application of the PPP to cases involving hazardous waste pollution underscores its role in guaranteeing that restoration obligations are proportional to the scale and severity of environmental harm, as shown by Larasati and Purwendah (2022). Ultimately, the PPP transcends its function as a legal or economic instrument and emerges as a comprehensive framework for achieving sustainable, just, and meaningful ecological restoration within Indonesia's environmental governance system (Ilmiah & Pendidikan, 2025).

#### 4.2. Indonesia's Regulatory Framework for PPP Enforcement and Its Inconsistency with Recovery Practices

Law No. 32 of 2009 on Environmental Protection and Management (Undang-Undang Perlindungan dan Pengelolaan Lingkungan Hidup/UUPPLH) constitutes the primary legal basis for the implementation of the Polluter Pays Principle (PPP) in Indonesia. Article 35 paragraph (1) and Article 53 paragraphs (1) and (2) explicitly stipulate that any individual or business entity that causes environmental pollution or damage is obligated to bear the entire cost of mitigation and environmental restoration resulting from its actions. This concept is also adopted in various implementing regulations, such as the Regulation of the Minister of Environment No. 13 of 2011 on Compensation for Environmental Damage, which provides technical guidelines for the calculation and collection of restoration costs (Ramadhan, 2024).

The UUPPLH represents an effort at environmental law enforcement that is preventive as well as corrective in nature. The preventive approach aims to avoid the occurrence of environmental problems, while the corrective approach seeks to restore degraded conditions to a better state. The UUPPLH provides a wide range of preventive measures that include instruments to prevent environmental pollution and degradation, such as strategic environmental assessment, spatial planning regulation, environmental quality standards, criteria for environmental damage, Environmental Impact Assessment (AMDAL), Environmental Management and Monitoring Efforts (UKL-UPL), licensing processes, environmental economic instruments, environment-related legal regulations, environmentally oriented budgeting, environmental risk analysis, environmental audits, and other instruments adapted to needs and developments in scientific knowledge. Meanwhile, corrective measures in environmental protection and management are implemented through the application of civil, administrative, and criminal law by imposing sanctions on those who violate regulations concerning pollution or environmental damage (Christallago et al., 2020).

However, upon closer analysis, the coherence between the theoretical concept of the PPP and Indonesia's regulatory structure still reveals a number of inconsistencies. Theoretically, the PPP requires the full internalization of externality costs, meaning that all environmental damage costs must be borne entirely by the polluter without any shifting of costs to other parties. In practice, however, Indonesian legislation often fails to guarantee this in a comprehensive manner, as there remain numerous gaps that allow restoration costs to be transferred to the state or society. Administrative instruments such as AMDAL (Environmental Impact Assessment), UKL-UPL (Environmental Management and Monitoring Efforts), and obligations regarding the management of hazardous and toxic waste (B3) are indeed intended to prevent and mitigate pollution at an early stage. Nevertheless, the effectiveness of these instruments is highly dependent on the quality of supervision and law enforcement. Many business actors exploit administrative loopholes, for instance by submitting inaccurate AMDAL documents or failing to carry out restoration commitments in accordance with regulatory requirements.

In the civil law domain, the PPP is realized through claims for compensation for environmental damage, which are often filed by the government or state institutions such as the Ministry of Environment and Forestry (KLHK). Court decisions indicate that the judiciary has accepted the PPP as a legal basis for determining the amount of compensation. However, the process of collecting compensation is frequently lengthy and bureaucratic, and not all cases are successfully executed in full. In the criminal law domain, the PPP is adopted through provisions governing environmental crimes, such as Article 60 of the UUPPLH, which allows perpetrators of pollution to be subjected to criminal sanctions in the form of fines and/or imprisonment. Nevertheless, these criminal sanctions are often disproportionate to the scale of the environmental damage caused, thereby failing to provide an adequate deterrent effect (Ali et al., 2023).

Logically, Indonesia's regulatory structure should support the full and consistent implementation of the PPP. In reality, however, inconsistencies between rules and practice persist. For example, environmental licensing often does not guarantee that business actors will fully comply with restoration obligations, particularly in cases involving large corporations that possess greater political access or resources (Sahala & Najicha, 2022).

Another inconsistency can be observed in the mechanisms for calculating environmental damage. Although technical guidelines exist, methods for calculating environmental damage often fail to encompass all ecological and social aspects, resulting in claimed costs that do not reflect the true value of the damage. Consequently, environmental restoration efforts are frequently insufficient. Moreover, the PPP should also encourage pollution prevention by generating a strong deterrent effect. However, in many cases, the administrative, civil, and criminal sanctions imposed remain relatively lenient, thereby failing to significantly influence changes in the behavior of business actors.

Although the PPP has been normatively adopted, its enforcement in practice continues to diverge from the theoretical concept. The PPP should place the full burden of restoration costs on polluters; yet in reality, its implementation is often limited to the payment of compensation or financial sanctions without ensuring comprehensive environmental restoration. In addition, there is still no specific formulation of the PPP in implementing regulations, resulting in enforcement that is highly dependent on judicial interpretation and executive policy. Overall, although Indonesia's regulatory structure formally adopts the PPP, there remains a logical inconsistency between the theoretical concept and its practical implementation. In Indonesia, the PPP often functions merely as a reactive instrument after damage has occurred, rather than as an effective preventive principle. This situation demonstrates the need for systemic improvements, both in regulatory design and law enforcement, so that the PPP can truly be realized in a coherent and effective manner.

#### **4.3. Social Dimensions and Fairness in PPP Implementation**

The polluter pays principle (PPP) is not solely related to financial aspects, but also concerns social justice. The PPP exists to ensure that the burden of environmental damage is not shifted to citizens, but is borne by polluters who benefit from their economic activities (Ramadhan, 2024) Social Aspects (Firdaus, 2021):

##### **4.3.1. Justice for local communities**

Communities living near industrial areas, mines, or plantations often suffer direct impacts in the form of air, water, and soil pollution. These impacts lead to health problems, decreased land productivity, and a decline in quality of life. PPP demands that companies take full responsibility by providing compensation and restoring the environment, so that communities do not have to bear the burden of losses themselves.

##### **4.3.2. Intergenerational justice**

Environmental damage that is not immediately addressed will be passed on to future generations. PPP ensures that current polluters bear the costs of remediation, so that future generations are not harmed by the negligence of the present. Thus, this principle contains an important intergenerational justice dimension for environmental sustainability.

##### **4.3.3. Restorative justice**

The modern legal approach emphasizes the restoration of social and ecological relationships, not just the imposition of fines. In the context of PPPs, companies may be required to finance health programs, social infrastructure development, or environmental improvements in affected villages. In this way, compensation takes the form not only of money, but also of concrete actions that improve the welfare of the community.

However, its implementation in the field still faces a number of obstacles related to social justice and policy effectiveness (Ramadhan, 2024).

##### **4.3.3.1 Power Imbalance**

In practice, there is an imbalance between large companies and local communities. Companies have far greater economic and political resources, as well as access to legal channels, enabling them to influence the course of environmental dispute resolution processes. In contrast, affected communities often lack legal knowledge, access to information, and financial support. This puts them in a weak position when it comes to demanding fair compensation or restoration.

##### **4.3.3.2 Transparency**

One of the main weaknesses in the implementation of PPP is the lack of transparency in the management of compensation funds. Fines or compensation paid by companies often go into the state treasury without being directly used for environmental restoration or compensation for affected communities. This has led to public distrust and reduced the effectiveness of PPP as an instrument of environmental justice.

##### **4.3.3.3 Participation**

The restorative justice approach emphasizes the importance of community involvement in determining the form of compensation. However, in reality, citizen participation is still very limited. As a result, the compensation provided is often not in line with the real needs of the community, for example, it only takes the form of financial fines without any health programs, environmental improvements, or social infrastructure development that would be more beneficial.

The implementation of PPP in environmental policy in Indonesia still faces major challenges. The power imbalance between companies and communities, weak transparency in the use of compensation funds, and minimal public participation are the main factors hindering its effectiveness. For PPP to truly become an instrument of environmental justice, it is necessary to strengthen regulations, establish transparent monitoring mechanisms, and provide greater opportunities for participation by affected communities in every stage of environmental restoration (Ramadhan, 2024).

The Polluter Pays Principle (PPP) fundamentally extends beyond a purely economic liability mechanism and must be understood as a framework of social justice that seeks to prevent the transfer of environmental burdens onto vulnerable communities, a normative stance long recognized in Indonesian environmental law doctrine by Muhdar (2009). In practice, communities residing near mining sites, industrial zones, and coastal exploitation areas frequently experience direct and cumulative harms, including declining environmental quality, health deterioration, and loss of livelihoods, conditions that Christallago et al. (2020) identify as persistent consequences of extractive activities. The PPP demands that polluters assume full responsibility for these social impacts through compensation and ecological restoration, thereby reaffirming the principle that environmental harm should not be subsidized by society at large, as emphasized by Purwendah (2021). From a justice-for-communities perspective, the principle aims to restore not only damaged ecosystems but also disrupted social relations and living conditions, a concern that Ali et al. (2023) link directly to violations of environmental quality standards. Accordingly, the social dimension of the PPP positions affected communities as rights-holders entitled to restoration and redress rather than passive recipients of regulatory decisions, as further reinforced by Ramadhan (2024).

Beyond present communities, the PPP embodies a strong commitment to intergenerational justice by ensuring that environmental degradation caused today does not compromise the rights and welfare of future generations, a conceptual foundation discussed extensively by Muhdar (2009). Environmental damage that remains unaddressed, particularly in mining and large-scale industrial contexts, creates long-term ecological deficits that are inherited by future populations, a pattern evident in jurisprudential analyses of environmental harm examined by Gaol et al. (2025). By obligating current polluters to finance remediation and restoration, the PPP functions as a temporal justice mechanism that allocates responsibility to those who benefit economically from environmentally harmful activities, as argued by Sahala and Najicha (2022). This forward-looking dimension aligns with broader environmental governance instruments, including environmental taxation schemes designed to discourage harmful practices while funding sustainable recovery, as discussed by Tanaya et al. (2023). Thus, intergenerational justice under the PPP reinforces the principle's ethical legitimacy by linking present accountability with future ecological sustainability, a linkage that Ramadhan (2024) frames as essential to restorative environmental justice.

Despite its normative strength, the implementation of the PPP in Indonesia continues to face substantial obstacles related to power imbalances, transparency deficits, and limited public participation, which collectively undermine its social justice objectives. Large corporations often possess disproportionate economic, political, and legal resources, enabling them to influence dispute resolution processes and weaken community claims, a structural inequality highlighted in environmental liability cases analyzed by Firdaus (2021). Transparency remains another critical challenge, as compensation and fines paid by polluters frequently enter state revenues without clear earmarking for ecological restoration or community recovery, thereby eroding public trust, a concern also noted by Christallago et al. (2020). Moreover, although restorative justice approaches emphasize participatory decision-making, affected communities are rarely meaningfully involved in determining the form and scope of restoration, resulting in remedies that fail to address actual social and ecological needs, as observed by Ramadhan (2024). Consequently, for the PPP to operate effectively as an instrument of environmental justice, systemic reforms are required to strengthen regulatory oversight, ensure transparent fund management, and institutionalize community participation across all stages of environmental restoration, as consistently advocated by Purwendah (2021) and Sahala and Najicha (2022).

#### **2.4. Implementation of PPP in Environmental Policy and Programs in Indonesia**

In Indonesian environmental law, the Polluter Pays Principle (PPP) is reflected in Law No. 32 of 2009 on Environmental Protection and Management. Article 87 stipulates that business actors who cause pollution are obliged to bear independently all costs necessary to prevent, control, and restore environmental damage, so that such burdens are not imposed on society or the state (Kurnia et al., 2023).

The concrete implementation of the Polluter Pays Principle (PPP) in Indonesia can be observed in waste management policies and environmental tax instruments. In waste management, local governments impose service charges on communities and business actors for waste collection and processing services. This scheme emphasizes that parties who generate waste are responsible for the costs of its management, thereby preventing the transfer of such burdens to the public or the state. This approach is consistent with the core principle of the PPP, namely that polluters must bear the consequences of their activities (Tanaya et al., 2023).

In addition, the PPP is also implemented through environmental taxes that function as fiscal mechanisms to internalize the impacts of pollution into production or consumption costs. Pursuant to Government Regulation No. 46 of 2017 on Environmental Economic Instruments, environmental taxes are imposed on a number of activities with the potential to cause environmental damage, such as groundwater extraction, the use of motor vehicle fuels, and mineral management. These taxes serve as disincentives, encouraging business actors to reduce negative impacts in order to avoid bearing higher tax burdens. Both waste service charges and environmental taxes reflect the implementation of the PPP in Indonesia, although their application still faces regulatory challenges and issues of consistency in enforcement (Tanaya et al., 2023).

Another example of the implementation of the Polluter Pays Principle (PPP) in Indonesia can be seen in cases of hazardous and toxic waste (B3) pollution. According to a 2021 report by the Ministry of Environment and Forestry (KLHK), the amount of B3 waste generated reached approximately 60 million tons, with the largest contributions coming from the manufacturing, infrastructure, agriculture, and energy and oil and gas sectors. Unfortunately, the utilization rate of this waste remains low, at only around 22.5%, meaning that the majority is still disposed of through landfilling, causing serious environmental impacts. The disposal of B3 waste has been proven to contaminate groundwater, reduce agricultural land productivity, and trigger various public health problems such as skin diseases and respiratory disorders (Larasati & Puspitasari, 2022).

In the legal context, the polluter pays principle is affirmed through Article 88 of Law No. 32 of 2009 on Environmental Protection and Management, which establishes strict liability for any party that generates or manages B3 waste. This means that waste-generating companies are obligated to bear compensation costs and undertake environmental restoration measures without the need to prove fault. In addition, companies are also required to implement Corporate Social Responsibility (CSR) as a form of social responsibility toward affected communities, thereby fostering a more harmonious relationship between industrial activities and the surrounding environment. The application of the PPP to B3 waste management in Indonesia constitutes a concrete example of how environmental law emphasizes the obligation of polluters to bear all consequences of their industrial activities, both through compensation mechanisms and preventive measures to avert further environmental damage (Larasati & Puspitasari, 2022).

An evaluation of the application of the polluter pays principle (PPP) in Indonesia can be conducted by examining its strengths, limitations, and determining factors for success. In terms of strengths, the PPP provides legal certainty that parties responsible for pollution are obliged to bear the costs of environmental restoration. This is reinforced by Article 88 of Law No. 32 of 2009 on Environmental Protection and Management, which establishes strict liability without the need to prove fault. This principle also has a preventive dimension, encouraging pollution prevention through waste management obligations, as well as a repressive dimension by requiring polluters to undertake restoration when damage occurs. The PPP can be applied in civil, criminal, and administrative domains, thereby affirming that polluters cannot evade responsibility (Ramadhan, 2024).

Nevertheless, several limitations remain in practice. Civil lawsuits are often difficult to pursue because victims of pollution must prove fault and causal relationships, which require high costs and complex scientific evidence. In the criminal domain, imposed sanctions frequently fail to produce a deterrent effect due to relatively low fines, and funds collected by the state treasury are not directly allocated for ecological restoration. Furthermore, there is an imbalance of power between large corporations and local communities, in terms of economic resources, access to information, and legal capacity. Regulations concerning the application of restorative justice in environmental cases are also still inadequate, meaning that the PPP has not yet been fully implemented through more equitable and participatory mechanisms (Ramadhan, 2024).

To achieve effectiveness, several key success factors must be taken into account. First, regulatory strengthening is required so that the PPP can be implemented through restorative justice mechanisms, thereby ensuring environmental restoration and compensation for affected communities. Second, the capacity of law enforcement officials such as judges, prosecutors, and police officers must be enhanced so that judicial decisions adopt an environmental perspective rather than merely focusing on punishment. Third, community participation needs to be expanded, both as a means of conveying restoration needs and as a mechanism for overseeing the agreements reached. Fourth, transparency in the use of compensation funds and the establishment of clear ecological indicators such as water and air quality or the success of reforestation should serve as benchmarks for evaluating the success of PPP implementation (Ramadhan, 2024).

The evaluation indicates that the PPP in Indonesia has strengths in the form of a strong legal foundation and its preventive repressive character, yet it continues to face limitations in aspects of evidentiary requirements, deterrent effects, and power imbalances. The success of its implementation depends on stricter regulations, enhanced capacity of law enforcement authorities, increased community participation, and transparency accompanied by measurable ecological indicators (Ramadhan, 2024).

## 5. Conclusion

Based on the results of the study, it can be concluded that the Polluter Pays Principle has been normatively adopted in Indonesia's environmental legal system and has become an important basis for enforcing polluter liability. This principle has great potential as an ecological restoration mechanism because it places the burden of restoration costs directly on polluters, thereby preventing the transfer of responsibility to the community or the state.

However, the effectiveness of PPP implementation in environmental disputes in Indonesia is still not optimal. The main obstacles include weak law enforcement, an imbalance of power between businesses and affected communities, a lack of transparency in the use of compensation funds, and minimal community participation in the environmental restoration process. In addition, the application of PPP tends to be reactive and focused on financial sanctions, without ensuring comprehensive and sustainable ecological restoration. Therefore, stronger regulations, the application of a restorative justice approach in environmental disputes, increased capacity of law enforcement officials, and active community involvement in the restoration process are needed. With these measures, the Polluter Pays Principle is expected to function effectively as an instrument of ecological restoration and realize environmental justice in Indonesia.

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