

Application of the polluter pays principle to household waste pollution for environmental policy

A Najwa^{1*}, N Muldiana¹ and Sarip¹

¹ Faculty of Law, Muhammadiyah University of Cirebon, Cirebon, Indonesia

* Corresponding author email: aliyinnajwa0246@gmail.com

Abstract

The Polluter Pays Principle (PPP) places the polluter as the party responsible for paying the costs of the pollution impacts they cause. In Indonesia, this principle has been adopted in environmental law policy through Law Number 32 of 2009 concerning Environmental Protection and Management (PPLH), but its application is still limited to the industrial sector and has not yet reached households, even though domestic waste contributes to most water pollution in urban areas. This study uses a normative-juridical approach and a literature review to identify challenges to PPP implementation in the household sector. The results indicate that the absence of explicit norms in national regulations and weak local government capacity are the main obstacles. This study recommends strengthening derivative regulations, developing community-based local policies, and educational approaches and environmental incentives to encourage the fair and participatory implementation of the PPP principle in the household sector.

Keywords

Polluter pays principle, Household waste, Indonesian environmental law

Introduction

The implementation of the Polluter Pays Principle (PPP) has become an important framework in global environmental policy, especially in the industrial sector which has a large capacity in producing waste. However, in the household sector, this principle has not been widely used as a primary reference, even though household waste pollution is increasingly becoming a critical challenge in environmental governance in Indonesia, especially with the growth of the urban population reaching 52% of the total population in 2024 with a figure that is predicted to continue to increase from year to year [1]. The pollution in question comes from waste produced by household activities, such as organic waste and inorganic waste, as well as liquid waste [2].

The Polluter Pays Principle states that any party that causes waste or pollution is responsible for bearing the costs of the resulting impacts, including the costs of preventing, controlling, and restoring environmental conditions. This approach developed in the 20th century with increasing global awareness of environmental issues

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and has become a fundamental principle in international environmental law and various national policies. PPP aims not only to serve as a punishment mechanism for polluters, but also as an instrument for internalizing environmental costs into economic activities so that actors consider the ecological impacts of their activities from the outset [3].¹

In Indonesia, this principle has been adopted in the national legal framework through Law Number 32 of 2009 concerning Environmental Protection and Management (PPLH), specifically in Article 2 letter f which states the polluter pays principle as one of the main principles [4]. However, the implementation of this principle in the field tends to still focus on the industrial sector, large-scale businesses, and activities covered by environmental licensing systems such as AMDAL or UKL-UPL. For example, the case of the oil spill by Pertamina in Balikpapan Bay successfully demonstrated how the Polluter Pays Principle can be used for the allocation of environmental recovery funds by business actors [5]. In contrast, the significant contribution of household waste to water and land pollution has not been clearly accommodated in national environmental policy. Data from the Ministry of Environment and Forestry (KLHK) states that around 60% of surface water pollution in urban areas comes from domestic waste, including in densely populated areas such as DKI Jakarta, Surabaya City, and the coastal areas of Cirebon Regency [6]. Despite their considerable quantitative significance, households are still not explicitly included as legal entities in environmental pollution liability mechanisms. This highlights a paradox in environmental policies that fail to accommodate the legal responsibility of micro-scale polluters like households.

Based on a study by Hindrasari and Halimatussadiah, domestic communities demonstrated a willingness to pay for a good waste management system when they received adequate understanding and facilities [7]. A similar study was also conducted by Dewi Fitria Maryanti, who examined household waste management in Bogor City and found that public support increased when waste management schemes involved citizen participation, information transparency, and environmental incentives [8]. This indicates the potential for implementing PPP principles at the household scale with a contextual and collaborative approach. This kind of approach will be more effective if supported by derivative legal instruments that can bridge individual responsibilities collectively in the living spaces of urban and rural communities.

As stipulated in Government Regulation No. 22 of 2021, domestic wastewater management is generally regulated through business licensing instruments and quality standards [9]. However, this instrument still leaves gaps at the micro level because it does not bind individual households, especially regarding the behavior of disposing of daily waste into waterways without a treatment system. This indicates that the

¹ The polluter pays principle is a principle often stated in international declarations that was later incorporated into international conventions and became a principle of international environmental law. The first international instrument referring to the polluter pays principle was the *Organisation for Economic Co-operation and Development* (OECD) 1872 (Mangku), an international economic organization founded by 34 countries in 1961, which aims to stimulate economic development and world trade.

application of PPP principles is not yet optimal vertically and horizontally in the institutional and civic context. This challenge is further complicated when linked to the limited capacity of local governments to formulate regulations governing environmental accountability at the household level, both in the form of regional regulations and community-based derivative policies.

This study aims to explore how the polluter pays principle is implemented in managing household waste, analyze its impact on pollution, provide recommendations for more effective environmental policies, and identify challenges and opportunities in its implementation. Furthermore, this study aims to raise public awareness of the importance of their role in maintaining environmental cleanliness and sustainability. It is hoped that recommendations will be found to improve the effectiveness of this principle's implementation in Indonesia.

Method

This research employs a normative legal methodology with qualitative analysis, employing a systematic approach to understanding law as a rule. Data collection was facilitated through the collection and analysis of legal materials, including legislation, official records, and relevant literature. Conclusions were drawn deductively to address the research questions.

Results and Discussion

Challenges of implementing the polluter pays principle for households

The Polluter Pays Principle (PPP), as introduced in the 1972 OECD document and subsequently adopted in various international and national legal instruments, aims to ensure that polluters bear the costs of the environmental damage they cause [10].² In the Indonesian context, this principle is legitimized in Law Number 32 of 2009 concerning Environmental Protection and Management (UU PPLH), specifically in Article 2 paragraph (11) and Article 69 paragraph (1) [4]. However, in practice, the implementation of this principle faces significant challenges, especially when faced with the reality of pollution originating from the household sector.

²The Polluter Pays Principle (PPP) has its roots in economic policy introduced by the Organisation for Economic Co-operation and Development (OECD) in 1972 through the *Recommendation of the Council on Guiding Principles concerning the International Economic Aspects of Environmental Policies*. This principle asserts that the costs arising from environmental pollution must be borne by the polluter, as an effort to internalize the external costs of economic activity. The OECD later strengthened this principle through the 1974 Recommendation, which expanded its scope not only to the costs of prevention and control, but also to the costs of recovery and administration related to pollution. Over time, PPP has become an important cornerstone of international environmental law, adopted in various global instruments such as the *Rio Declaration on Environment and Development* (1992), which stipulates in Principle 16 that polluters should bear the costs of environmental damage. At the regional level, PPP forms the basis of European Union regulations, including in Article 191 of the *Treaty on the Functioning of the European Union* (TFEU), and is adopted in national policies and regulations in various countries, such as the United States through CERCLA/Superfund, and in a number of regulations in France, Australia, and several African countries. The implementation of this principle continues to be developed to emphasize the legal and economic obligations of polluters to bear the burden of the damage caused.

The PPP principle is philosophically rooted in the theory of internalization of externalities developed by Arthur C. Pigou, which states that external costs resulting from economic activity must be returned to the actors through fiscal or regulatory instruments [11].³ In the context of environmental law, PPP becomes an instrument to internalize the negative impacts of environmentally polluting behavior into the economic and social considerations of the actors. This means that actors are not only morally responsible, but also obliged to bear the material impacts of the pollution they cause.

The first fundamental challenge is the absence of explicit recognition of households as legal subjects bearing ecological responsibilities [12].⁴ The environmental legal structure in Indonesia has historically and normatively placed more emphasis on the supervision of business entities and industrial entities, which are quantitatively and administratively easier to control [13]. In contrast, households are considered micro-units that are individually too small to be reached by legal instruments, even though collectively households are the largest contributors of waste nationally. Based on the 2023 National Waste Management Information System Report of the Ministry of Environment, households contribute approximately more than 60% of the solid waste produced by households [14].

This inequality is further exacerbated by the absence of technical instruments that establish environmental responsibility standards for households. For example, there are no clear parameters regarding the type and amount of waste that is considered polluting the environment if it originates from the domestic sector [15]. Without objective standards and measurements, it is very difficult for law enforcement to determine the limits of household responsibility. As a result, the implementation of the PPP principle is only a rhetorical tool that is unable to reach the majority of everyday polluters who actually come from the micro scale. This is not simply a technical regulatory issue, but concerns the epistemic gap between law as a normative system and ecological reality as a social system.

³ Arthur Cecil Pigou's thinking became an important foundation in the development of welfare economic theory, particularly regarding the internalization of externalities. Pigou introduced the idea that in economic activities there is often a *divergence* between the *private net product* (private benefits obtained by economic actors) and the *social net product* (benefits or net costs felt by society as a whole). When economic activities generate external costs, such as *air pollution, water pollution, or environmental damage*—which are not borne by economic actors—market failure occurs. To remedy this condition, Pigou suggested the implementation of *Pigovian taxes*, namely taxes imposed on economic actors equal to the value of the *marginal social damage* or marginal social loss they cause. In other words, this tax aims to make economic actors pay the true social costs of their activities, thus creating a more efficient and equitable allocation of resources from a social perspective. This model provides a framework for governments to correct market distortions caused by negative externalities and is an important inspiration for the birth of the *Polluter Pays Principle* (PPP) by the OECD in 1972 within the framework of international environmental law.

⁴ The environmental legal structure in Indonesia, as stipulated in Law No. 32/2009 or Law No. 6/2023, is administrative and normative in nature, encompassing the oversight of industrial entities, including environmental permits, quality standards, and sanctions. However, there is a scarcity of legal provisions regarding households as subjects of ecological law, resulting in the practice of discharging daily domestic waste into waterways being neither regulated nor enforced. The legislative focus is on formal businesses, not individual households.

The second challenge is the socio-cultural aspect, which still views environmental management as solely the responsibility of the state or the industrial sector [16].⁵ In many communities, households do not internalize the principle that they have a role in maintaining environmental quality [17].⁶ This stems from a lack of environmental education and the absence of clear participation spaces for residents in the waste management system. For example, people generally dispose of household waste such as used cooking oil or detergent into waterways without realizing that this action has long-term impacts on aquatic ecosystems [18]. The absence of information systems, incentives, or community-based monitoring forums leaves households in a passive position, rather than being responsible ecological actors.

A study by Hindrasari and Halimatussadiyah confirmed that when households receive education and understanding regarding the impacts of pollution, accompanied by clear incentive mechanisms, the level of participation in waste management increases significantly [7]. This finding is in line with the behavioral economics approach which suggests that ecological behavioral changes are more effectively achieved through understanding benefits and responsibilities, rather than a purely punitive approach [19]–[22].⁷ Therefore, PPP principles must be integrated with educational and participatory strategies to effectively reach the household sector.

The third challenge is the limited institutional support in reaching households as part of the environmental management system [23]. Local governments, as the spearhead of environmental policy implementation, often lack adequate human resources, budgets, and monitoring systems to undertake a participatory and educational approach to the community [24]–[27].⁸ As a result, the focus of policy tends to be on the formal sector, which can be held administratively accountable, while the informal or domestic sector is left to operate without structured control. This indicates that the problem of

⁵ Indonesian society's socio-cultural context still tends to view environmental management as the responsibility of the government or industry, rather than individuals. Higher trust in public institutions and weak social norms lead to minimal household involvement in environmental action. Yet research shows that individual motivations for action, such as *perceived behavioral control* and *subjective norms*, are more effective in driving green behavior change than top-down regulations.

⁶ *value-action gap* between ecological awareness and actual behavior, where despite their concern for *waste reduction*, they fail to implement it in their daily activities. Studies in 12 Indonesian cities show that *perceived behavioral control* and *subjective norms* are the primary drivers of environmentally friendly behavior. Without institutional support and community pressure, domestic ecological responsibility is difficult to internalize. Collectivistic cultures, including mutual cooperation (*gotong royong*), tend to lead residents to believe that environmental management is a shared responsibility—reducing *the sense of individual accountability*.

⁷ Various studies in *behavioral economics* confirm that ecological behavioral change is more successfully achieved through strategies that emphasize understanding the benefits (direct benefits for individuals/communities), a sense of responsibility (*empowerment* and *social norms*), and positive incentives (rewards, environmentally friendly *defaults*), rather than a purely punitive approach. For example, the OECD states that the design of environmental incentives must consider the limits of human rationality, not just taxes; Sunstein & Reisch prove that green *defaults* encourage environmental adoption better than large incentives; the PMC collective behavior study explains that rewards are more effective in initiating collaboration, while *punishment* only maintains; and *the value-action gap phenomenon* shows that knowledge and benefits clearly increase individual environmental responses more than legal pressure.

⁸ Local governments often lack the technical resources, personnel, and budget to provide participatory and educational approaches to communities. Initiatives such as operational monitoring, community training, and neighborhood-level sanitation facilities are not optimal—minimal budgets (less than 2% of the regional budget), limited personnel, and institutional fragmentation often stall these efforts.

implementing PPPs for households is not only due to the absence of regulations, but also the weakness of the institutional infrastructure that supports it.

The fourth challenge relates to the aspect of social justice and household economic capacity. The application of the PPP principle assumes that all polluters are able to bear the costs of the impacts they cause [28]–[30].⁹ However, in reality, not all households have sufficient economic capacity and knowledge to access waste management facilities independently. In this context, the PPP principle risks creating a disproportionate additional burden on low-income households if it is not accompanied by a subsidy or incentive mechanism [31]–[33].¹⁰ Therefore, a distributive justice approach that takes socioeconomic disparities into account is needed so that this principle does not become a tool of structural oppression against marginalized groups. Theoretically, the concept of ecological citizenship developed by Andrew Dobson emphasizes that every individual has ecological responsibilities as part of their membership in the ecological community, not simply because of their formal citizenship status. [34].¹¹ In this view, households are not only users of resources, but also bear moral and practical responsibility for environmental sustainability. This approach encourages the formation of a legal system that is not only top-down, but also recognizes the capacity of individual agents to create structural change through their daily practices.

By reformulating the PPP principle within a framework that responds to these structural, socio-cultural, and theoretical challenges, environmental law in Indonesia can transform into a system that not only enforces regulations but also encourages active

⁹The implementation of the *Polluter Pays Principle* (PPP) in Indonesia has the potential to create social injustice if not accompanied by corrective instruments that take into account household economic capacity. Siregar, using the *Social Accounting Matrix approach*, shows that the carbon tax policy in Indonesia, as a concrete implementation of PPP, tends to be regressive because the burden of costs is heavier for low-income households. The OECD itself emphasizes that the implementation of PPP must be accompanied by social protection mechanisms to prevent exacerbating social and economic disparities, particularly in developing countries.

¹⁰The implementation of the *Polluter Pays Principle* (PPP) in household waste management risks creating a disproportionate economic burden on low-income households if not balanced with subsidies or incentives. A study in Ghana by Duan et al. showed that willingness to pay for waste management services is strongly influenced by education and income levels, where households with low incomes and education have limited economic and knowledge access to waste management facilities. Furthermore, the OECD emphasizes that without social protection, the PPP principle can actually create injustice in developing countries. International schemes such as *Pay-As-You-Throw* (PAYT) implemented in Hong Kong demonstrate that incentives such as free trash bags and subsidies for poor households are important in mitigating the regressive impact of waste management fees.

¹¹The concept of *ecological citizenship*, developed by Andrew Dobson, represents a new paradigm of citizenship that goes beyond mere legal-formal status within a nation. Dobson offers a critique of conventional citizenship traditions that generally focus on rights and obligations within the territorial scope of the nation-state. He argues that in the context of the transboundary global ecological crisis, citizenship should be understood within the framework of *post-national citizenship*, namely, identity and responsibility that are not limited by national territory, but by the ecological impacts that individuals generate through their consumption and production. Dobson asserts that ecological citizenship requires every individual to bear ecological responsibility for the impact they have on the global ecological community, even if those impacts occur far from where they live. He calls it relational and asymmetric citizenship, because responsibility is not evenly distributed but is determined by how much an individual contributes to environmental degradation through their ecological footprint. Within this framework, those who consume excessively are obligated to reduce their ecological footprint while redressing the resulting ecological injustice. Furthermore, ecological citizenship is intergenerational, bearing a moral obligation to ensure environmental sustainability for future generations. Dobson also highlights the aspect of justice. Ecological citizenship is a global issue, where ecological responsibility is not only related to the relationship between humans and nature, but also to the distribution of social justice and access to resources between developed and developing countries, which are often victims of ecological inequality resulting from global exploitation. Thus, *ecological citizenship* demands not only changes in individual behavior but also political engagement in demanding ecologically and socially just policies and fighting for a more equitable global system for the distribution of environmental responsibilities.

community participation in collectively caring for the earth. The urgency to integrate PPP principles into the household sector stems not only from ecological needs but also from demands for social justice and the sustainability of national environmental law going forward.

Reconstruction of policies and design of implementation of PPP principles proportionally to households

The need for policy reformulation to apply the Polluter Pays principle to the household sector is a response to the structural inequalities previously analyzed. In this context, a policy approach is needed that is not merely legalistic but also humanistic, contextual, and based on the principles of social justice and ecological sustainability. Such reform must position households as legitimate ecological actors, taking into account their social, economic, and cultural capacities.

Philippe Nonet and Philip Selznick's theory of legal responsiveness can serve as a foundation for designing environmental policies that are adaptive and reflective of community needs. In this theory, law is not simply a tool of state control, but rather a normative system that must interact dynamically with social needs, cultural values, and the capacities of local actors. When the PPP principle is applied to households, an overly coercive legal approach will lead to passive resistance and violations. [35].¹² Therefore, the law must be transformed into a tool of empowerment that builds dialogical relations between the state and citizens.

One concrete example can be found in the Cirebon City Government policy through Cirebon Mayor Regulation Number 6 of 2019 concerning Cirebon City's Policy and Strategy in Managing Household Waste and Household-Similar Waste for 2018 – 2025 [36]. In the Mayor Regulation, the Cirebon City government regulates household responsibilities in sorting and managing organic and inorganic waste. In addition, the Cirebon City Environmental Service actively initiated the Climate Village Program (ProKlim) in several sub-districts which focuses on community empowerment in

¹² In this theory, Nonet and Selznick introduce a framework for legal evolution in three stages: repressive law, autonomous law, and responsive law. In the repressive law stage, law functions as an instrument of political power oriented towards conquering and controlling society without considering social values or substantive justice. In the autonomous law phase, law begins to establish itself as an institution relatively independent of political power, enforcing objective and procedural rules to maintain legal certainty and protect rights. However, Nonet and Selznick believe that autonomous law still has limitations because it tends to be rigid and insensitive to social complexity. The culmination is the law phase. Responsive, where the law is not only implemented to enforce rules procedurally, but is also directed to respond to the needs, demands, and values that exist within society. Responsive law is adaptive, participatory, and reflective, and oriented towards achieving substantive justice through active community involvement in the process of law formation and implementation. Nonet and Selznick emphasize that law must be a channel for social transformation by opening space for local dynamics, paying attention to cultural diversity, and adapting to ongoing social change. In the context of environmental policy, including the application of the *Polluter Pays Principle (PPP)* to the community, responsive legal theory offers an important foundation so that policies are not merely coercive instruments such as fines or levies without regard for the socio-economic conditions of citizens. The application of law that relies solely on a punitive approach or formal control risks generating social resistance or passive compliance, especially among low-income communities who are structurally limited in terms of economic and knowledge. The principle of responsive law requires that policies such as PPP be designed inclusively, through public participation, ecological education, and strengthening local capacity, so that the implementation of the law is not only procedurally legal but also *legitimate* in the eyes of the community.

household-scale waste management, including training in composting and waste banks [37], [38].

This type of program represents an embryonic form of implementing PPP principles in a more contextual and participatory manner. In practice, households participating in the ProKlim program in Cirebon City are not only trained technically but also receive incentives in the form of environmental credits, equipment assistance, and logistical support from the local government. Community involvement in this process aligns with the principle of co-governance, where the state and communities share responsibility for managing environmental resources collaboratively.

Policy design that is proportionate and responsive to local realities must also involve fiscal and non-fiscal incentive mechanisms. For example, households that actively sort and recycle waste can receive reduced waste collection fees or be included in an annual environmental award scheme held by the city/regional government [39]–[41]. This approach is able to internalize PPP principles in a non-coercive manner, but based on awareness and voluntary participation.

Environmental policies should also adopt the principle of cross-subsidy, so that the implementation of the PPP principle does not become an additional burden for low-income households.¹³ In this case, the Regional Government can establish incentive zoning where households in areas with a high poverty index are exempt from certain levies, while other areas with higher economic capacity can be subject to more proportional waste management rates [42], [43]. This principle is rooted in John Rawls' theory of distributive justice, which prioritizes the fair distribution of burdens and benefits based on socio-economic position [44].¹⁴

In addition to regulatory and policy aspects, the deliberative process is also key to success. The concept of deliberative democracy developed by Jurgen Habermas emphasizes the importance of public spaces that allow citizens to actively participate in

¹³ This means that wealthy households can bear environmental costs, while low-income households receive relief or incentives, so that PPP does not become an additional burden. A study by Siregar using the Miyazawa input-output model shows that the carbon tax in Indonesia is regressive, with low-income groups bearing a greater burden and recommends cross-subsidies to improve social equity. Op., Cit. Siregar, "Estimation of the Effect of Carbon Tax Implementation on Household Income Distribution in Indonesia: Quantitative Analysis with Miyazawa Input-Output Approach."

¹⁴ The theory of distributive justice developed by John Rawls in *A Theory of Justice* offers an essential normative framework for designing public policies, including environmental policies. Rawls formulated two principles of justice, the second of which, known as *the difference principle*, states that inequality in the distribution of resources or burdens is only legitimate to the extent that it contributes to improving the welfare of the least advantaged groups in society. Using *the original position* and *veil of ignorance hypotheses*, Rawls asserts that just policies are formulated without considering individual socioeconomic positions, so that everyone will rationally choose the distribution of burdens and benefits that best protects marginalized groups. In the context of environmental policy, this *difference principle* forms the basis for the implementation of cross-subsidies as a form of fair burden distribution: high-income groups bear a greater proportion of environmental management costs, while low-income households receive relief or exemption from the burden. This approach ensures that policies such as the implementation of *the Polluter Pays Principle (PPP)* are not merely legal but also have moral legitimacy because they address structural inequalities in society. Thus, Rawls's principle of distributive justice not only encourages equitable distribution of environmental benefits but also serves as an ethical corrective to the potential regressive impacts of uniform cost-based policies for all social classes.

policy formulation [45].¹⁵ In the context of Regional Government or Village Government, the Development Planning Deliberation (Musrenbang) can be strengthened as a deliberative forum that discusses the needs and strategies for locally based household waste management. This forum allows citizens to become not only objects of policy, but also subjects who determine the direction of environmental management in their area.

Finally, the establishment of a community-based evaluation system is a crucial tool for assessing the effectiveness of PPP implementation. Local governments can establish neighborhood unit (RT/RW)-based environmental performance indicators integrated with incentive systems. Furthermore, households that do not participate or are found to be polluting can be subject to social sanctions in the form of published environmental scores or restricted access to certain assistance programs. This approach is not merely punitive, but rather serves as a moral and social incentive that strengthens collective ecological awareness.

By integrating progressive legal theory, local practices, and participatory approaches, PPP principles become not only legal norms but also social values that shape the character of ecological communities. This policy reconstruction will strengthen the resilience of environmental systems to crises and encourage the creation of just, inclusive, and sustainable environmental governance at the household level.

Conclusion

The application of the Polluter Pays (PPP) principle in the context of household waste management is a multidimensional challenge that requires a legal approach that is not only formal but also responsive to the surrounding social, structural, and ecological complexities. The previous discussion has shown that households, as domestic entities that contribute the majority of national waste generation, remain marginalized from the legal framework of environmental responsibility. The absence of a clear normative mechanism, weak institutional capacity, and the underdevelopment of an ecological culture at the community level are major obstacles to the fair and proportional implementation of this principle.

The analysis also shows that the implementation of PPP principles cannot be forced through a coercive approach alone, but must be achieved through a combination of educational strategies, incentives, public participation, and the development of derivative regulations that recognize households as subjects of ecological law. The

¹⁵The concept of deliberative democracy, developed by Jürgen Habermas, emphasizes that valid and just policy formulation must be based on citizen participation through rational discourse in the public sphere. For Habermas, the public sphere is an arena where citizens exchange arguments without the dominance of power, to form a shared understanding and social legitimacy for the resulting policies. Participation is not simply access to information or formal consultation, but must be an egalitarian discursive process, where the most rational and just arguments are accepted through intersubjective consensus. In the context of environmental policy, the application of this principle is crucial so that policies related to incentives, cross-subsidies, or waste management truly reflect the needs, capacities, and values of local communities, thereby increasing the legitimacy and effectiveness of these policies.

integration of theoretical concepts such as the internalization of externalities (Pigou), ecological citizenship (Dobson), responsive law (Nonet & Selznick), and distributive justice (Rawls) provides an important foundation for formulating policies that are not merely repressive but also transformative.

Thus, the application of the Polluter Pays principle to households is not a form of shifting state responsibility to the people, but rather a reaffirmation that the right to a good and healthy environment must be accompanied by ecological responsibility on the part of every citizen. Indonesian environmental law reform must move toward a more humane, inclusive, and participatory direction, so that the principles of ecological justice do not stop at the declarative level, but are truly realized in the daily practices of society.

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