

## STRENGTHENING SANITATION REGULATIONS: MEASURING THE EFFECTIVENESS OF ENVIRONMENTAL SANCTIONS FOR DOMESTIC WASTEWATER MANAGEMENT IN DENSELY POPULATED AREAS

Elly Christanty Gautama<sup>\*1</sup>, Justian Stanley Tuhuteru<sup>2</sup>, Fayola Issalillah<sup>3</sup>, Rahayu Mardikaningsih<sup>4</sup>, Rommy Hardyansah<sup>5</sup>

<sup>1,2,3,4,5</sup>Universitas Sunan Giri Surabaya

Email: [dr.ellychristantigautama@gmail.com](mailto:dr.ellychristantigautama@gmail.com)<sup>\*1</sup>

### Abstract

The management of domestic wastewater in densely populated areas is a critical issue situated at the intersection of public health policy and environmental law in Indonesia. This normative juridical research aims to analyze the legal construction of obligations for domestic wastewater management and the effectiveness of the environmental sanction system in fostering compliance within densely populated zones. The findings indicate that a comprehensive legal framework has been established through a regulatory hierarchy, beginning with the 1945 Constitution, Law No. 32 of 2009 concerning Environmental Protection and Management, Law No. 36 of 2009 concerning Health, and extending to various technical regulations such as Minister of Environment and Forestry Regulation No. P.68/2016 on Domestic Wastewater Quality Standards. Legal obligations are imposed reciprocally upon the state to provide systems and upon the community to comply. Regarding enforcement, a sanction system encompassing administrative, civil, and criminal penalties has been established under the Environmental Protection and Management Law. However, the effectiveness of this sanction system within the context of densely populated areas remains limited. This limitation is attributed to factors such as limited monitoring and evidentiary capacity, the absence of adequate alternative infrastructure, and prevailing socio-economic constraints within the community. This study concludes that successful sanitation law enforcement requires an integrative approach, combining sanction instruments with infrastructure provision, institutional strengthening of oversight, and sustained public education.

**Keywords:** Domestic Wastewater, Densely Populated Areas, Health Law, Environmental Law, Administrative Sanctions, Legal Certainty, Sanitation.

### INTRODUCTION

The management of domestic wastewater constitutes a fundamental aspect of public health and environmental protection. Improperly managed wastewater has the potential to become a medium for disease transmission and a source of groundwater and surface water pollution (Nurmalasari & Mardikaningsih, 2022). This problem becomes increasingly complex in densely populated residential areas, where high population and building density place extra pressure on limited sanitation infrastructure. Technical difficulties in constructing centralized management systems, coupled with community behaviors that are not yet fully environmentally conscious, create a multi-dimensional challenge (Giwa et al., 2024). From a legal perspective, this issue is no longer viewed merely as a technical sanitation problem but has evolved into a legal matter involving the right to a healthy environment and the right to

health as components of human rights. The state bears the obligation to ensure the fulfillment of these rights through effective legal instruments and public policies. Challenges to legal effectiveness are often caused by regulatory incoherence and institutional gaps. This pattern is also evident in the management of other types of waste, such as in Khayru et al. (2024) study on medical waste, which shows how this weakens health protection. These findings provide an analytical framework for evaluating whether similar obstacles exist in the management of domestic wastewater in densely populated settlements.

The relationship between poor sanitation and disease burden has long been a concern in global health literature. Environmentally based diseases such as diarrhea, cholera, dysentery, and typhoid are strongly correlated with access to clean water and adequate sanitation facilities. Densely populated residential environments with minimal sanitation serve as ideal incubators for pathogens, threatening individual health and imposing an economic burden on public health systems. Therefore, interventions in the sanitation sector cannot be separated from broader efforts to improve public health standards. The public health approach positions wastewater management as a primary pillar of preventive medicine, which is significantly more effective and efficient than curative treatment after disease outbreaks occur (García-Searcy et al., 2022). Given the strategic position of domestic waste management as a pillar of preventive health, the legal framework and its enforcement must support this function. The study by Nuraini et al. (2021) on environmental management and law enforcement is relevant in providing a perspective on optimising legal instruments to ensure compliance with waste management standards, which ultimately protects public health.

From the dimension of environmental law, domestic wastewater management falls within the realm of water pollution control. The primary principles in environmental law are the prevention principle and the polluter pays principle. Every individual or household generating waste is fundamentally a potential source of pollution. The law serves to regulate the management of this pollution potential and to minimize its negative impacts on the environment and others (Dahar et al., 2022; Vanesa et al., 2024). This regulation becomes even more critical in the setting of densely populated areas, where the proximity between waste sources and sources of clean water or other dwellings is extremely close, thereby elevating the risk of cross-contamination. Without stringent regulation and consistent

enforcement, densely populated areas can easily transform into zones of environmental and health vulnerability. Efforts to improve the effectiveness of legal instruments regulating pollution, including domestic waste, are crucial. This is in line with the focus of Herisasono et al. (2021) research, which examines improving the effectiveness of legal instruments in tackling pollution to protect public health. Their study provides an important evaluative perspective for assessing the implementation of the prevention and polluter pays principles in domestic waste regulations, as well as recommendations for improvements in vulnerable areas such as densely populated settlements.

In Indonesia, the legal framework for domestic wastewater management is dispersed across various laws and regulations. The 1945 Constitution, in Article 28H paragraph (1), guarantees every person's right to a prosperous life physically and spiritually, to reside, and to obtain a good and healthy environment. This constitutional guarantee is subsequently translated into various sectoral laws. Specific regulations concerning wastewater can be found in Law No. 32 of 2009 concerning Environmental Protection and Management, which obligates every person to prevent and control water pollution. Furthermore, Law No. 36 of 2009 concerning Health mandates the provision of environmental health, including wastewater management, to achieve an optimal standard of public health (Halide, 2023). Further technical regulations are stipulated in Government Regulations, Ministerial Regulations, and Regional Regulations.

However, the existence of what appears to be comprehensive regulation does not automatically guarantee effective implementation, particularly in densely populated areas (Mardikaningsih, 2024). A gap exists between legal norms on paper and on-the-ground realities. The causative factors are varied, ranging from limitations in local government budgets for infrastructure development, low institutional capacity, to a level of community compliance that still requires improvement. This study aims to examine the legal construction of domestic wastewater management in densely populated areas as an integral part of public health policy. The analytical focus will be directed towards two main aspects: first, the legal obligations imposed on various parties (government, community, businesses) regarding sanitation; and second, the effectiveness of the environmental sanction system in fostering compliance with these obligations. Through a normative juridical approach, this research seeks to map and analyze the entire regulatory chain along with its legal implications.

A fundamental problem lies in the fragmentation and overlapping of regulations governing domestic wastewater management. Authority and responsibility between central, provincial, and regency/city governments are often not clearly integrated. Law No. 23 of 2014 concerning Regional Government divides governmental affairs between central and regional authorities. Sanitation affairs are included among the mandatory affairs related to basic services for regencies and cities. However, the establishment of standards, norms, and criteria remains the authority of the central government. In practice, misalignment between central and regional regulations frequently occurs, causing confusion in implementation. Moreover, regulations from other sectors such as health, public works, and environmental management also govern the same subject from different perspectives, thereby creating legal complexity that can in fact impede concrete action in the field (Fitzpatrick, 2008).

At the community level, especially in densely populated areas, a problem exists regarding the low ownership of and access to adequate sanitation facilities. Many households lack septic tanks meeting technical standards or are not connected to piping systems. Domestic waste is often directly discharged into open channels, rivers, or empty land. This behavior reflects not only economic constraints but also a lack of understanding regarding the associated health and legal risks. Although regional regulations may mandate each household to possess a septic tank, enforcement of this rule is very weak. Approaches that prioritize incentives and socialization over repressive law enforcement are often not balanced with adequate budgetary support and government programs, rendering behavior change efforts ineffective (Mara, 2004). This situation highlights the paradox of implementing the precautionary principle in Indonesian environmental law: it is adopted normatively, but fails to be realised in the practice of domestic waste management in densely populated settlements. Hidayat et al. (2024) study on the implementation of this principle in plastic waste management provides an appropriate analytical lens for evaluating this gap, in order to explain why the principle has not yet become an effective preventive measure. Amidst the challenges of law enforcement, active participation from local communities is a key element that is often overlooked. A study by Djaelani (2021) shows that direct community involvement can create mechanisms for monitoring, socialisation and behavioural change that are more organic and sustainable than top-down approaches alone.

The system of law enforcement and the application of sanctions for wastewater management violations also face serious constraints. Administrative sanctions regulated under the Environmental Protection and Management Law, such as written warnings, government coercion, or fines, are in practice rarely applied to violations committed by individuals or households. Law enforcement is more frequently focused on large-scale businesses. Limitations in the resources of environmental monitoring personnel at the regional level, convoluted procedures, and difficulties in proving violations from scattered and unregistered sources make household-level law enforcement a non-priority. Consequently, the legal norms regarding the obligation for domestic waste management lose their coercive power and preventive function. The community does not experience the legal consequences of non-compliance, rendering the rules mere symbols without substance (Gautama & Mardikaningsih, 2022). The weakening of administrative law enforcement has shifted the focus to other mechanisms, namely criminal law. Mahmud et al. (2024) study on criminal law enforcement for perpetrators of environmental pollution is relevant to explore in order to examine the role of criminal instruments in filling the enforcement gap at the household level or creating a stronger deterrent effect.

According to Novita et al. (2022), the issue of domestic waste management has gained new relevance within the framework of the Sustainable Development Goals (SDGs). SDG Target 6.2 emphasizes the importance of access to adequate sanitation and hygiene and ending open defecation practices. The Indonesian government has committed to achieving these SDG targets. A comprehensive legal study is required to evaluate the extent to which national and regional regulatory frameworks are aligned with this global commitment and to identify the necessary legal reform steps to accelerate target achievement. Without a strong and implementable legal foundation, efforts to meet SDG sanitation targets risk becoming merely an administrative agenda without tangible impact for communities in densely populated areas.

On the other hand, pressure on environmental quality and water resources is intensifying alongside population growth and urbanization. Sources of clean water are becoming increasingly scarce and vulnerable to pollution. Inappropriate wastewater management will accelerate water quality degradation, ultimately threatening long-term water security and public health. An appropriate legal approach serves not only as a control

tool but also as an instrument for education and the formation of social norms. Therefore, an examination of the current effectiveness of domestic wastewater management law constitutes an investment in building future environmental and public health resilience, particularly in the most vulnerable areas such as densely populated settlements. Environmental sustainability investments require a structural-legal and cultural-educational approach (Mardikaningsih & Darmawan, 2021). In line with the educational function of law, the study by Safira et al. (2022) shows that pro-environmental learning within the family is a critical foundation. Synergy between educational law at the macro level and the socialisation of values at the family level can create more profound and sustainable behavioural change in domestic waste management (Halizah & Mardikaningsih, 2022).

This research aims to analyze the legal construction and regulatory effectiveness of domestic wastewater management in densely populated areas as a component of public health policy in Indonesia. Specifically, the research seeks to examine and map the legal obligations imposed on the government, the community, and business actors regarding sanitation based on prevailing laws and regulations. Furthermore, this research aims to analyze the effectiveness of the environmental sanction system within the Environmental Protection and Management Law and its derivative regulations in fostering compliance with these obligations within densely populated areas. Theoretically, the research is expected to enrich the discourse in health law and environmental law, particularly at the intersection of sanitation regulation, public policy, and law enforcement. Practically, the research findings can serve as evaluation material and provide recommendations for policymakers, local governments, and law enforcement officials in designing and implementing more effective, equitable, and supportive regulations for domestic wastewater management to achieve an optimal standard of public health.

## RESEARCH METHOD

This research employs a normative legal research method with a qualitative approach through a literature study. This approach is chosen as it aligns with the objectives of analyzing, interpreting, and synthesizing legal norms within laws and regulations, as well as understanding policy construction and enforcement effectiveness from a doctrinal perspective. Normative research focuses on law as a system of norms, encompassing their

level of validity, systematic structure, and hierarchical order. This research does not collect primary empirical data but focuses instead on secondary data comprising primary, secondary, and tertiary legal materials. Primary legal materials include relevant legislation such as the 1945 Constitution, Law Number 32 of 2009 concerning Environmental Protection and Management, Law Number 36 of 2009 concerning Health, and their implementing regulations. Secondary legal materials consist of scientific textbooks, journal articles, and expert commentary in the fields of health law, environmental law, and public health. Tertiary legal materials encompass legal dictionaries and encyclopedias used to understand terminology.

The literature search was conducted through legal and scientific databases such as Google Scholar, ScienceDirect, and Sinta (Science and Technology Index). The primary inclusion criteria were literature substantially discussing legal, regulatory, or policy aspects of wastewater management, sanitation, and environmental law enforcement in Indonesia or similarly contextualized developing countries. Literature that is purely technical without policy or legal analysis, as well as popular publications and mass media, were excluded.

Data analysis was performed using qualitative content analysis and thematic synthesis techniques. All collected legal materials and literature were read in-depth to identify legal concepts, principles, and regulatory patterns. A coding process was applied to tag and group data according to emerging themes, specifically the themes of "construction of legal obligations" and "effectiveness of sanctions." The analysis was conducted interactively, as described by Miles and Huberman (1994), encompassing data reduction, data display, and conclusion drawing/verification. Data reduction was carried out by summarizing and selecting the most relevant data in relation to the research questions. The data were then presented in the form of structured narrative descriptions. Synthesis was performed by comparing and integrating findings from various sources to construct a coherent legal argument. Research quality assurance was maintained through the principle of source triangulation, comparing the consistency of interpretations derived from legislation with expert doctrine and other academic studies, thereby ensuring the scientific accountability of the analytical results.

## RESULTS AND DISCUSSION

## **Legal Construction of Obligations for Domestic Wastewater Management in Public Health Policy**

The legal construction of obligations for domestic wastewater management in Indonesia is rooted in constitutional guarantees. The 1945 Constitution of the Republic of Indonesia, in Article 28H paragraph (1), establishes the right of every person to a prosperous life physically and spiritually, to reside, and to obtain a good and healthy environment. This article serves as the highest philosophical and juridical foundation, imposing reciprocal obligations upon the state to fulfill this right and upon every person to refrain from acts that damage the environment of others. From this constitutional norm, various sectoral laws are subsequently derived to operationalize the right to a healthy environment, including through wastewater management, which is a potential source of pollution. The right to a healthy environment is inseparable from the right to health, as a polluted environment directly threatens the physical integrity and health of the community (Putri & Fidiyani, 2025). Therefore, the regulation of domestic wastewater is inherently cross-sectoral, spanning environmental law and health law.

Law Number 32 of 2009 concerning Environmental Protection and Management serves as the primary legal umbrella that explicitly constructs this obligation. Article 20 of this law states that every person is obligated to preserve the sustainability of environmental functions and to prevent and control environmental pollution and damage. The formulation "every person" in this article has a very broad scope, encompassing individuals, groups, and legal entities. Consequently, every household in densely populated areas, as a waste-generating entity, is directly burdened with the legal obligation to prevent pollution originating from its domestic activities. This obligation is general in nature and requires further elaboration through technical regulations. Furthermore, Article 16 of the law introduces the pollution prevention instrument of environmental quality standards. Domestic wastewater quality standards are subsequently established as an objective legal parameter to determine whether a household or group of households has fulfilled its management obligation or has instead committed an unlawful act (Muhammad et al., 2024). The principle of reducing waste is relevant not only in the environment, but also in operations. In line with this, Radjawane et al. (2022) applied the principles of lean management to reduce waste and improve operational efficiency in the service sector. Both emphasise the same philosophy:



that managing and minimising "waste" is the foundation for a sustainable and responsible system.

Law Number 36 of 2009 concerning Health provides a complementary perspective by positioning wastewater management as a component of environmental health. Article 162 paragraph (1) of the Health Law stipulates that the government is responsible for ensuring the availability of a healthy environment. Paragraph (2) clarifies that this responsibility includes, among other things, the implementation of a wastewater management system. While the Environmental Protection and Management Law emphasizes the obligations of legal subjects (every person), the Health Law places greater emphasis on the responsibility of the state (the government). This construction creates a reciprocal legal relationship: the government is obligated to provide the system and infrastructure, while the community is obligated to use that system correctly and not pollute the environment. In densely populated areas, this governmental responsibility becomes crucial because spatial limitations and technical complexities often render individual solutions, such as conventional septic tanks, inadequate, necessitating state intervention through the provision of communal or centralized treatment systems (Masnun et al., 2024).

Government Regulation Number 22 of 2021 concerning the Implementation of Environmental Protection and Management (GR 22/2021), as a derivative of the Environmental Protection and Management Law, provides a more operational construction. This regulation distinguishes wastewater management based on the scale and type of activity. For household-scale activities, management can be conducted individually or communally. Article 361 of GR 22/2021 obligates every person conducting a business and/or activity that generates wastewater to undertake wastewater management. Although the phrase "business activity" leans more toward business actors, an interpretation of "activity that generates wastewater" can encompass household activities producing domestic waste (Sitoresmi, 2025). This regulation also governs monitoring and reporting obligations for specific wastewater managers, although these stipulations may be unrealistic for individual household scales. However, for managers of communal systems in densely populated areas, these obligations become relevant. The principle of reporting obligations is an important element of accountable environmental governance. In line with this, the study by Mamesah et al. (2024) highlights the importance of transparency and accountability in waste

management. The study emphasises that an effective reporting framework is key to compliance and public trust.

Regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number P.68/MENLHK/SETJEN/KUM.1/8/2016 concerning Domestic Wastewater Quality Standards is a decisive technical instrument. This regulation establishes parameters and threshold values for domestic wastewater that may be discharged into the environment. Parameters such as Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), and microbiological parameters such as Total Coliform become standardized legal measures. The existence of these quality standards transforms the obligation of wastewater management from an abstract duty to "prevent pollution" into a concrete obligation to "meet quality standard values." This means that every household or manager of a communal system in densely populated areas is not only required to possess a septic tank or channel wastewater to a drain, but that tank or system must operate with a certain level of effectiveness so that its effluent meets the legally established standards. This adds a technical dimension to the legal obligation (Sujuangon Jhansen Rambe et al., 2024).

From the perspective of water resources management, Law Number 17 of 2019 concerning Water Resources also provides a relevant framework of obligations. Article 24 of this law prohibits any person from conducting activities that cause water pollution. This prohibition is general and encompasses the discharge of domestic wastewater into water bodies without adequate treatment. In densely populated areas often located along riverbanks or having drainage channels directly connected to rivers, the obligation not to pollute water resources becomes critically important. This law also regulates the requirement for permits to discharge wastewater into water sources, which, within the scope of domestic activities in densely populated areas, is further regulated through regional regulations. This legal construction affirms that domestic wastewater is not merely a private matter but is linked to the management of a public resource (water) protected by the state.

At the regional government level, Law Number 23 of 2014 concerning Regional Government provides a specific mandate and obligation. Environmental and health affairs are concurrent matters falling under the authority of regional governments. Article 14 paragraph (1) states that environmental affairs constitute a mandatory affair related to basic services. This means that regency and city governments have a legal obligation to administer

environmental management, including domestic wastewater management. This obligation is realized in the form of regional regulations, budget allocation, infrastructure development, and oversight. In densely populated areas, the obligation of regional governments becomes even greater, as the complexity of the problems requires more intensive and creative governmental intervention (Wiraatmaja et al., 2022), for instance, by constructing communal-scale neighborhood Wastewater Treatment Plants (WWTPs) or renovating drainage systems integrated with waste treatment.

Regulation of the Minister of Health Number 3 of 2014 concerning Community-Based Total Sanitation offers a legal construction of obligations that is more oriented toward empowerment and participation. The STBM approach, with one of its pillars being safe domestic wastewater management, encourages communities to independently identify problems and seek sanitation solutions. Although persuasive and non-penal in nature, the STBM framework has a strong legal basis and forms part of the national sanitation strategy. In densely populated areas, this approach is important because purely repressive law enforcement is often ineffective. The legal construction through STBM places greater emphasis on the formation of social norms and community commitment, supplemented with technical support and facilitation from regional governments. The legal obligation of the community in this model stems not only from the threat of external sanctions but also from internal social agreements and pressures within the community.

All the legal constructions described above interact within a system that ideally reinforces each other. However, in densely populated areas, this interaction often presents implementation challenges. An individual's obligation to possess a septic tank meeting quality standard (according to the Minister of Environment and Forestry Regulation) may conflict with spatial and financial constraints. The regional government's obligation to provide infrastructure (according to the Regional Government Law and Health Law) is constrained by budgetary limitations and development priorities. Consequently, what is termed a regulatory gap occurs, where existing legal norms cannot be fully applied within the socio-economic reality of densely populated areas. The existing legal construction tends to be one-size-fits-all, not yet fully accommodating the specific characteristics and inherent limitations of dense settlements, such as extremely high building density, unclear land ownership status, and diverse economic levels within the community (Pratiwi, 2024). The study by Nurmalasari and

Nuraini (2021) shows that the success of environmental policies depends on the integration of local wisdom and community participation. These findings suggest that closing the regulatory gap in domestic wastewater management requires a similar approach, by designing participatory mechanisms that take into account the specific conditions and local knowledge of the community.

From a public health policy perspective, this legal construction is fundamentally an instrument for achieving broader public health objectives, namely reducing morbidity and mortality from water and sanitation-related diseases. Every legal obligation imposed, whether on individuals or the government, ultimately converges on efforts to break the chain of disease transmission. Therefore, the effectiveness of this legal construction should not only be measured by formal compliance with regulations but, more substantively, by a reduction in disease rates and an improvement in environmental quality. The legal approach in domestic wastewater management must thus be integrated with public health approaches, including disease surveillance, health promotion, and evidence-based interventions. Without this integration, the law will remain an ivory tower that fails to address the root health problems in densely populated areas.

### **The Effectiveness of Environmental Sanctions as an Instrument for Enforcing Sanitation Obligations**

The system of administrative sanctions regulated under Law Number 32 of 2009 concerning Environmental Protection and Management serves as the first line of enforcement for violations of domestic wastewater management obligations. Articles 76 through 91 of this law elaborate on a tiered range of administrative sanctions, from written warnings and government coercion to administrative fines, suspension or revocation of environmental permits, and environmental restoration orders. Theoretically, this tiered enforcement provides an opportunity for violators to promptly correct their actions before heavier sanctions are imposed. In densely populated areas, these sanctions should be applicable to households demonstrably discharging domestic waste directly into public drains or water bodies without treatment, or to environmental managers (such as neighborhood associations) negligent in managing communal systems (Utama & Suharta, 2018). However, the effectiveness of these administrative sanctions depends on the proactive monitoring

capacity of regional governments. In many regions, the number of environmental inspectors is severely limited compared to the area's size and the number of potential violation sources, leading to monitoring activities that tend to be reactive and complaint-driven rather than actively conducted.

Government coercion, as one of the most powerful instruments of administrative sanction under Article 77 of the Environmental Protection and Management Law, holds the potential to directly order violators to undertake restoration or construct treatment facilities. In densely populated areas, government coercion orders can be issued to compel a group of residents or area managers to build communal septic tanks or neighborhood-scale Wastewater Treatment Plants (WWTPs). However, its effectiveness is frequently constrained by socio-economic realities. The execution of a government coercion order requires financial resources, and if the recipient of the order lacks financial capacity, the directive becomes unenforceable (Qoilun & Wulandari, 2024). Consequently, this administrative sanction can stall, and the government coercion document becomes merely archival without tangible implementation. This condition illustrates that the effectiveness of administrative sanctions cannot be separated from governmental program support and funding to assist communities in fulfilling their legal obligations, particularly in densely populated areas with varying economic levels.

Criminal sanctions regulated in Chapter XV of the Environmental Protection and Management Law, specifically Articles 98 through 120, are intended to deter perpetrators of severe or intentional pollution. The threat of significant imprisonment and fines, especially for pollution resulting in illness or death, should theoretically be capable of preventing violations. However, within the scope of domestic wastewater management violations in densely populated areas, the application of criminal sanctions faces substantial evidentiary challenges. To prove the element of intent or negligence in the act of disposing of household waste, public prosecutors must establish a scientific and juridical link between the actions of a single household and the specific pollution impact that occurred. In densely populated environments with numerous and intermingled pollution sources, proving this causal link becomes exceedingly difficult (Faturrohman, 2024). Furthermore, law enforcement officials (the police and prosecution service) often prioritize other criminal cases deemed more

significant, causing household-scale environmental violations to rarely become the focus of criminal prosecution (Nuraini et al., 2022).

Civil sanctions through lawsuits for compensation, as guaranteed under Article 87 of the Environmental Protection and Management Law and related provisions, provide an avenue for aggrieved parties to seek accountability from polluters. For example, residents whose well water is contaminated by seepage from a neighbor's septic tank can file a civil lawsuit. This instrument is complementary as it provides direct restorative justice to victims (Scholles & Siska, 2024). Nevertheless, its effectiveness in densely populated areas is also limited. Civil proceedings are protracted, require legal counsel fees, and burden the victim with a challenging evidentiary burden. Communities in densely populated areas, typically with limited resources, tend to be reluctant to engage in a complex and risky legal process. They often prefer familial or informal settlements, or even choose inaction, resulting in the underutilization of this civil lawsuit mechanism and suboptimal deterrence.

The effectiveness of the entire sanction system is highly dependent on the existence and enforcement of quality standards as objective legal parameters. The Regulation of the Minister of Environment and Forestry Number P.68/MENLHK/SETJEN/KUM.1/8/2016 concerning Domestic Wastewater Quality Standards provides the technical basis for determining whether a violation has occurred. Without laboratory testing of wastewater samples, it is impossible to impose sanctions fairly and accurately. This represents the primary weakness of the enforcement system at the local level. Regional Environmental Offices generally lack their own laboratories or routine budgets for sampling and testing domestic wastewater from every violation site (Ngaisah, 2022). As a result, law enforcement is often based solely on visual evidence (the presence of direct discharge) without quantitative proof that quality standards have been exceeded. This makes imposed sanctions vulnerable to legal challenge and undermines the credibility of the law enforcement process itself.

Law Number 11 of 2020 concerning Job Creation, which amended several provisions in the Environmental Protection and Management Law, introduced a more integrated law enforcement mechanism through the Online Single Submission (OSS) system and risk-based supervision. Ideally, this system could track compliance by business actors, potentially including managers of apartments or dense housing complexes, regarding their waste management. However, for individual households in traditional densely populated areas, the

OSS system is not applicable. The Job Creation Law also simplified administrative sanctions, but its focus is more on business facilitation. Its implication for enforcement effectiveness in densely populated residential areas could be negative, as governmental attention and resources are increasingly drawn to monitoring formal business actors, while oversight of non-business violations (households) becomes further marginalized (Yunita et al., 2024).

Regional Regulations (Perda) play a central role in determining the effectiveness of sanctions on the ground. Based on the authority derived from Law Number 23 of 2014 concerning Regional Government, local governments can issue Regional Regulations on Cleanliness and Landscaping Management or Health Regulations that contain specific sanction provisions for sanitation violations, including direct fines for littering or indiscriminate liquid waste disposal. Sanctions in Regional Regulations are typically simpler and more direct, such as on-the-spot cash fines that can be imposed by the Municipal Civil Service Police Unit (Satpol PP). In several cities, such approaches have demonstrated higher effectiveness because the enforcement officers (Satpol PP) are more numerous and possess direct authority in the field. However, their effectiveness still depends on the consistency of operations and the transparency of assessment. If enforcement is incidental or discriminatory, sanctions will fail to create a uniform and sustainable deterrent effect (Maulidya et al., 2024; Putra et al., 2025). Strategies that rely solely on repressive sanctions are often unsustainable. On the other hand, participatory approaches based on public awareness such as those examined by Djaelani and Priambodo (2022) in their study of waste bank programmes offer an alternative. The study shows that active community involvement with positive incentives can build a more independent and sustainable culture of cleanliness than the threat of sanctions alone.

A key non-legal factor influencing sanction effectiveness is the availability of alternatives. Sanctions will be perceived as unjust and likely rejected by the community if they lack other viable options to comply with the law. In densely populated areas with severely limited space, the obligation to possess individual septic tanks meeting technical standards is often physically impossible to fulfill. In such situations, imposing fines or warnings on residents will only generate resistance without solving the underlying problem (Maulidya et al., 2024). Therefore, the effectiveness of sanctions must be viewed within a broader policy framework where sanction instruments must be preceded and accompanied by the provision

of public infrastructure by the government, such as constructing communal WWTPs or centralized piping systems. Without these infrastructural solutions, sanctions risk becoming merely tools for coercion or an additional burden on the poor, rather than instruments for achieving environmental and health protection objectives (Mardikaningsih & Wardoyo, 2024).

From the perspective of legal culture, the effectiveness of sanctions is also determined by the extent to which legal norms have been internalized by the community. Law enforcement that relies solely on the fear of external sanctions (coercion) without being accompanied by an understanding of the benefits of compliance (persuasion) will be fragile and costly. Programs such as Community-Based Total Sanitation (STBM) regulated under the Regulation of the Minister of Health Number 3 of 2014, are essentially designed to build this collective understanding and commitment. When the community itself agrees to and oversees waste management rules within its environment, compliance emerges from within. External government sanctions in this context function as a reinforcer of established social norms, not as the primary driver. In densely populated areas with strong social bonds, this combined approach of formal law enforcement and community norm strengthening holds greater potential for effectiveness (Wulansari et al., 2024).

Limitations in the resources and institutional capacity of regional governments constitute a systemic obstacle to sanction effectiveness. Budgets for supervision, laboratory testing, and legal prosecution are often severely constrained. A limited number of environmental inspectors must handle a wide range of issues, from industrial to medical waste, causing attention to domestic waste to be divided. Moreover, coordination among relevant agencies (Environment, Health, Public Works, Civil Service Police) is frequently suboptimal, resulting in fragmented and non-synergistic enforcement efforts (Dippu et al., 2023). Without strengthening institutional capacity and increasing adequate budget allocation for monitoring and enforcement functions at the grassroots level, even an ideal sanction system will be difficult to implement effectively. This is reinforced by the findings of Darmawan et al. (2025), who, in the context of hazardous waste management, also identified that limited resources and inter-agency coordination are critical factors that hinder the implementation of ideal regulations.



In conclusion, the effectiveness of the environmental sanction system in promoting compliance with domestic wastewater management in densely populated areas is conditional and partial. Normatively, the legal framework is complete, featuring a tiered system of sanctions from administrative and civil to criminal. However, its operational effectiveness is constrained by several factors: limitations in monitoring and evidentiary capacity, the absence of adequate alternative infrastructure, the low economic capacity of a segment of the population to comply, and the suboptimal coordination and resource allocation of regional governments. The sanction system cannot function in isolation; it requires a supportive policy ecosystem encompassing infrastructure provision, community empowerment programs, capacity building for enforcement institutions, and sustained public education. Without this supportive ecosystem, environmental sanctions risk becoming merely blunt legal instruments that fail to transform behavior and improve compliance in domestic wastewater management within densely populated areas.

## CONCLUSION

Based on the conducted normative juridical analysis, it can be concluded that domestic wastewater management in densely populated areas in Indonesia possesses a comprehensive and multi-sectoral legal foundation, integrating public health and environmental protection objectives. The legal construction of wastewater management obligations is structured in a tiered manner, originating from the constitutional guarantee of a healthy environment, translated within the Environmental Protection and Management Law and the Health Law, and operationally elaborated through various government regulations, ministerial regulations, and regional regulations. These obligations are imposed reciprocally upon the state (in this case, regional governments) to provide infrastructure and systems, and upon every person and household to use these systems correctly and avoid pollution. Regarding enforcement, an environmental sanction system has been comprehensively established, encompassing administrative, civil, and criminal penalties. However, the effectiveness of this sanction system in fostering compliance within densely populated areas still faces significant challenges, primarily related to monitoring and evidentiary capacity, limitations of alternative infrastructure, and the socio-economic

constraints of the community. A gap exists between the completeness of norms on paper and the capacity for their implementation in the field.

The findings of this study carry significant implications for various stakeholders. For policymakers at the central level, the primary implication is the necessity to evaluate the effectiveness of existing regulations by considering the specific characteristics of densely populated areas. Technical regulations, such as domestic wastewater quality standards, need to be accompanied by realistic implementation guidelines, including financing schemes and appropriate technologies for conditions of limited space and varying community economic capacities. For regional governments, this study's findings affirm that the responsibility for law enforcement must be balanced with the government's obligation to provide basic infrastructure. Without the provision of adequate communal or centralized wastewater treatment systems in densely populated areas, the enforcement of sanctions will be perceived as unjust and counterproductive. For environmental and health law enforcement officials at the regional level, these findings underscore the importance of developing integrative and educative enforcement strategies that are not merely repressive but also foster behavioral change through sustained facilitation and socialization.

Based on these conclusions and implications, several strategic recommendations are proposed. First, it is recommended that the Ministry of Environment and Forestry, in collaboration with the Ministry of Health and the Ministry of Public Works and Public Housing, develop a specific-locus Technical Guide for Domestic Wastewater Management in Densely Populated Areas. This guide should contain feasible treatment technology options for narrow spaces, participatory financing schemes (such as cross-subsidies or revolving funds), and community-based management institutional models reinforced by Regional Regulations. Second, regional governments are advised to allocate adequate and sustainable budgets within their Regional Revenue and Expenditure Budgets (APBD) for two key purposes: (a) the construction and maintenance of communal sanitation infrastructure in densely populated areas as a priority, and (b) strengthening the capacity of regional environmental monitoring units, including the provision of simple water quality testing equipment and enhancing human resource competency. Third, law enforcement institutions and regional governments are encouraged to develop a collaborative law enforcement model involving community leaders, non-governmental organizations, and the business sector (through CSR). This model could

take the form of a Special Task Force for Sanitation in Densely Populated Areas, authorized to conduct integrated socialization, conflict mediation, and recommendations for administrative sanctions, thereby making law enforcement more accessible, swift, and acceptable to the community.

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