LEGAL AND SOCIO-ECONOMIC OUTLOOK OF WASTE BANK: ENVIRONMENTAL POLLUTION AND PUBLIC HEALTH ASSESSMENT IN SUSTAINABLE HOUSEHOLD WASTE MANAGEMENT PRACTICES

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Abstract

The purpose of this study is to investigate and establish a regulatory model for managing household waste with a public health approach. The research employs a statutory approach combined with a comparative methodology to analyze and explore the connections between law and other social institutions. Various laws and regulations are directly associated with waste management, including Law No. 32 of 2009 on Environmental Protection and Management and other similar legislation. The enforcement of these laws and regulations in waste management relates to three legal systems: structure, substance, and legal culture. The study's results show that the enforcement of environmental law in waste management is a blend of legal structure, legal substance, and legal culture. It can also be studied from both preventive and repressive sides. The study highlights the importance of implementing sustainable waste management practices to reduce environmental pollution and minimize health risks to the public. Through legal intervention, sustainable waste management practices can become standardized and be effectively enforced, leading to cleaner and safer living environments. The study concludes that preventing and responding to waste management issues requires a comprehensive approach that includes legal measures, as the implementation of laws and regulations plays an essential role in ensuring responsible waste management practices and protecting people's health.

Keywords: Sustainable Practices, Waste Management, Waste Bank, Environmental Law, Public Health

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1. INTRODUCTION

One of the reasons for the imbalance in the environment is the growth of the population. As the population increases, so does the demand for goods and services, which leads to a rise in waste production and disposal (Ncube et al., 2021; Shah et al., 2021). This increase in waste poses a significant threat to the environment, especially in densely populated areas such as cities. Despite this, waste management has not been adequately addressed in these areas (Kabirifar et al., 2020; Ruban et al., 2014). The situation has resulted in a hazardous level of pollution globally. According to Galloway et al. (2017), there is a high amount of interaction of microplastic debris throughout the marine ecosystem. Rifa and Hossain (2022) also argue that plastic pollution poses a significant threat to human health and the environment, and it hinders progress towards Sustainable Development Goals (SDGs) like clean water and sanitation, responsible consumption and production, and life below water. Chowdhury and Hossain (2021) highlight the importance of environmental law in promoting sustainability in agriculture and reducing greenhouse gas emissions and point to the influence of international conventions, such as the Paris Agreement, in setting global targets for reducing carbon emissions and implementing sustainable agriculture practices.

Chandra and Sobirov (2023) stated that in 2015, Indonesia ranked second globally for dumping 187.2 million tonnes of plastic waste into the ocean, following China. As stated in Law No. 18 of 2008 on Waste Management, waste refers to the remaining materials resulting from human activities or natural processes. Environmental waste is composed of two interrelated components that impact each other, whereby an imbalance in one aspect will affect the organisms and ecosystem in the surrounding area (Pinontoan & Sumampouw, 2019). Throughout the entire waste management cycle, all waste will ultimately be deposited in the final disposal site, also known as the *tempat pembuangan akhir* (TPA). This phase can utilize a variety of techniques, ranging from simple to high-tech. The open dumping process is one of the most well-known final disposal methods (Ramli et al., 2021; Haryoto et al., 2014). This approach involves stacking the waste in alternating layers between soil coverings. Another commonly used technique is the sanitary landfill method, which is a more controlled and sanitary way of managing waste. This approach involves proper processing of the waste in a designated area to prevent any negative impact on the environment or public health. In essence, waste management involves a series of procedures aimed at reducing, reusing, and recycling waste while ensuring that any remaining waste is properly disposed of. The final disposal stage is the last step of this process and encompasses multiple methods to manage waste effectively and sustainably. The goal is to mitigate the adverse impacts of waste on human health, the environment, and local communities (Lebreton & Andrady, 2019). Effective waste management is not only important for addressing the current waste issue but also for achieving a sustainable future for generations to come.

This research aims to investigate sustainable household waste management practices to address environmental pollution and public health concerns arising from increasing household waste. It contributes theoretically by developing a model that considers the intricate interactions among stakeholders in waste management, including households, collectors, authorities, and the environment. Grounded in sustainable development and environmental law theories, this research fills a gap in the literature regarding household waste management in Indonesia, emphasizing environmental and public health aspects. Despite existing waste management regulations, implementation and comprehension issues persist, leading to significant environmental and health challenges. The study's objective is to establish a regulatory model prioritizing environmental and public health interests and explore its short-, medium-, and long-term implementation. The research employs a qualitative approach, focusing on analyzing laws and government regulations, offering guidance for improving sustainable household waste management practices in Indonesia.

The article is divided into several sections. Section 1 is an introduction that outlines the importance of sustainable household waste management by emphasizing environmental and public health aspects and the role of government in regulating its policies. Section 2 is a literature review that explores sustainable household waste management and its relation to environmental and public health aspects. Section 3 is the research methodology, which used qualitative methods carried out in three different locations. This research uses a holistic approach to understand the relationship between law and social institutions. Section 4 describes the research analysis, which presents findings about various policies and strategies in waste management covering technical aspects, collection and transportation, processing, and institutional aspects, as well as strategies aimed at increasing the efficiency and sustainability of waste management and involving various related parties. Finally, Section 5 is the conclusion, which directly addresses the main research questions raised in the introduction. It brings together the main findings of the analysis and provides an understanding of sustainable household waste management, which requires a holistic approach involving environmental, public health, technical, and institutional aspects, with the expansion of effective policies and strategies.

2. LITERATURE REVIEW

The concept of sustainable household waste management with a public health approach underscores the critical need for managing domestic waste in a manner that not only addresses environmental concerns but also prioritizes the well-being and health of the public. This approach recognizes that waste generated at the household level can have significant repercussions on both the environment and the health of individuals and communities (Serge Kubanza & Simatele, 2020; Zamri et al., 2020). Sustainable household waste management implies implementing practices that aim to reduce, reuse, and recycle waste materials,

minimizing their negative impact on the environment (Nainggolan et al., 2023; Yu et al., 2021). Additionally, it involves adopting measures that consider public health as a central factor in waste management strategies (Sharma et al., 2021). This approach acknowledges that improper disposal of waste can lead to various health hazards, including the spread of diseases, contamination of water sources, and the proliferation of harmful pollutants (Siddiqua et al., 2022).

Understanding the legal framework in the context of waste management is crucial because it forms the backbone of regulations and guidelines that govern how waste is handled, processed, and disposed of (Elehinafe et al., 2022). This legal framework typically encompasses national and local laws, regulations, and policies that set standards for waste management practices (Agamuthu & Barasarathi, 2021). Key legislation, such as Law No. 32 of 2009 on Environmental Protection and Management, plays a central role in shaping the legal landscape of waste management. Furthermore, comprehending the environmental framework related to waste management involves recognizing the broader ecological implications of waste generation and disposal. This includes assessing how waste can contribute to environmental pollution, such as soil and water contamination, air pollution, and habitat degradation. It also involves examining how waste management practices can mitigate these negative impacts and promote environmental sustainability.

Waste management is a field heavily influenced by various legal regulations, especially those related to environmental issues (Aslam et al., 2020). In Indonesia, Law No. 32 of 2009 on Environmental Protection and Management is one of the primary regulations that govern various aspects of waste management, covering everything from waste disposal methods to allowable waste processing techniques. In addition to national-level regulations, local regulations also play a crucial role in governing waste management practices at the community level. These regulations may include more specific provisions tailored to the conditions and needs of specific regions. For example, some regions may have regulations specifying waste collection schedules, the types of containers to be used or even special programs to address particular waste issues.

A deep understanding of the legal framework governing waste management becomes crucial. This is because these laws and regulations form the regulatory foundation that binds waste management practices. Through an analysis of these legal aspects, the research can evaluate the extent to which these laws are implemented and effective in ensuring responsible and sustainable waste management. As such, waste management guided by environmental and legal regulations becomes a robust foundation for achieving the goals of reducing environmental pollution and enhancing public health in general.

The application of law in waste management involves three legal systems: structure, substance, and legal culture (Mangku et al., 2020; Putrijanti & Wibawa, 2021). This reflects how the law is not just a set of regulations but also encompasses how these regulations are applied in everyday practices and how they influence the culture and behaviors related to waste management. The structure of law refers to the formal legal framework that governs waste management (Forti et al., 2020; Márquez & Rutkowski, 2020). It includes the creation of laws, regulations, and policies related to waste, defining the roles and responsibilities of various stakeholders, and establishing the legal institutions responsible for enforcing these laws. For example, it outlines who is responsible for waste collection, transportation, and disposal, as well as the penalties for violations. The substance of the law delves into the content of the laws and regulations related to waste management (Zarbà et al., 2021). It specifies the rules and standards that must be followed, such as waste disposal methods, recycling requirements, and environmental impact assessments. The substance of the law defines what is considered legal and illegal in waste management practices (Patil & Ramakrishna, 2020; van Ewijk & Stegemann, 2020). Legal culture represents the broader societal attitudes, beliefs, and behaviors related to law and its enforcement. In the context of waste management, legal culture influences how individuals and communities perceive waste regulations and their willingness to comply with them. It also plays a role in shaping community norms regarding waste reduction, recycling, and environmental responsibility.

The importance of a preventive and punitive approach in waste management not only reflects responsiveness to waste-related issues but also constitutes an integral part of sustainable waste management strategies. The preventive approach, being proactive, aims to reduce the volume of waste generated and its environmental and public health impacts (Hettiarachchi & Meegoda, 2023). This includes waste reduction efforts, reuse, recycling, and public education on sustainable practices. Meanwhile, the punitive approach involves law enforcement and sanctions for violations in waste management, ensuring compliance with existing regulations (Sugiartha et al., 2021). The combination of both forms a comprehensive framework for effectively managing waste, with a focus on reducing environmental pollution and ensuring sustainable public health protection.

Through appropriate legal interventions, sustainable waste management practices can become standardized and effectively implemented. This means that there will be clear regulations and guidelines in place, backed by legal authority, to ensure that waste is managed in an environmentally responsible manner. Such measures lead to a cleaner and safer environment for the public, as waste is handled and disposed of with proper consideration for its impact on both the surroundings and people's health. Furthermore, it is essential to emphasize that addressing waste management challenges requires a comprehensive approach that encompasses legal actions. Laws and regulations play a pivotal role in ensuring that waste management practices are not only responsible but also protective of public health. This highlights the integral role of legal frameworks in achieving responsible waste management and safeguarding the well-being of the community.

3. RESEARCH METHODOLOGY

The research undertaking deploys a comprehensive combination of two distinct yet synergistic methodologies — the statute approach and the socio-legal approach — to delve profoundly into the intricate and symbiotic relationship between law and various social institutions. This study stands apart from conventional approaches that consider law in isolation, as it takes a holistic perspective, conceiving law as a dynamic social institution intricately interwoven with other societal dimensions. The central premise underlying this method involves recognizing the law's profound interplay with a spectrum of social factors. This approach ventures into the multidimensional and interdependent relationship that law shares with diverse social institutions encompassing realms such as politics, economics, culture, and society. By exploring the interwoven tapestry of law and these social entities, the study delves into how these components coalesce and influence each other's evolution.

To achieve this comprehensive understanding, the research relies upon a qualitative research method. This method is strategically chosen to ensure that the richness of the data is captured, facilitating the collection of descriptive information about individuals and actors in the socio-legal landscape. Through the medium of written or spoken words, this qualitative approach enables an in-depth exploration of the perceptions, experiences, and interactions of the participants within the legal and social framework. By capturing these nuanced insights, the study aims to unearth the complex interplay between law and society, transcending mere quantitative analysis.

It is worth noting that this qualitative research approach diverges from traditional methodologies that often segment individuals and organizations into isolated variables or hypotheses. Instead, it embraces a holistic lens that recognizes the interconnectedness of these entities within the broader social and legal milieu. By doing so, it strives to provide a more nuanced and holistic understanding of how law functions within the intricate web of society. The study was carried out across three distinct geographical regions, namely Semarang City, Kendal Regency, and Semarang Regency. This diverse selection of locations ensures a comprehensive exploration of how the interrelation between law and social institutions manifests across different contexts, thereby contributing to a more robust and well-rounded analysis.

4. RESULTS

4.1. Waste management: Policies and strategies

Waste management policies and strategies have multiple aspects that need to be considered for a comprehensive approach. The technical aspect involves reducing waste at the source by increasing public awareness about the 3R (reduce, reuse, recycle) concept and developing an incentive and disincentive system. The collection and transportation system policies aim to improve transportation efficiency and limit the transfer of waste from carts to trucks to service areas in a planned and fair manner. The processing system policy aims to optimize the use of waste facilities and infrastructure, increasing their capacity according to service targets and developing appropriate waste handling technologies that are environmentally sound and based on public health. The institutional aspect involves developing policies, rules, and regulations that a designated institution can implement to produce quality waste services that are environmentally friendly and based on public health. Strategies involve increasing cooperation and coordination with stakeholders, increasing human resources' quality, completeness of legal products for implementing waste management and encouraging the application of a monitoring system and legal sanctions to foster community participation.

The financing aspect involves cost recovery of waste management services as part of the public service provided by the government for society's welfare. Strategies must include equalizing decision makers' perceptions and boosting increased cost recovery from waste management through financing. The community participation aspect aims to increase community involvement in waste management by changing the understanding that society is not just an object but a partner in the effort to reduce waste and improve patterns of waste management based on public health. This implies equality among stakeholders in the waste management process. This means that developing comprehensive waste management policies and strategies that address the various aspects involved is crucial to promoting sustainable waste management practices that positively impact communities' public health and environmental well-being. By focusing on reducing, reusing, and recycling waste at the source, improving transportation and collection systems, optimizing processing and management systems, developing institutional and financing policies, and encouraging active community involvement, waste reduction goals can be achieved while promoting environmentally sound practices that benefit all.

The most ideal approach to managing household waste is to recycle it, creating new uses and benefits. This not only contributes to environmental preservation but also economically reduces handling costs. Blum's (1974) theory outlines four public health degree factors, including behavioral, community service, genetic, and environmental factors. Improper waste accumulation can result in disease transmission and support for the regulatory model for household waste management in encouraging community involvement. By increasing public awareness and fostering a sense of responsibility for maintaining a clean environment, the neighborhood plays a crucial role in promoting environmental health. The role of the head of the neighborhood unit is especially decisive in improving environmental health through the waste bank program. The neighborhood unit initiates this program by establishing a garbage bank that helps improve environmental health and lowers waste disposal volumes in temporary landfills. The potential around a community presents opportunities for improving their quality of life. The waste bank is one such opportunity for economic resource utilization.

4.2. Socio-economic and legal culture analysis of waste bank

Blum's (1974) theory presents four health degree factors, including behavior, community service, genetics, and environment, which affect public health (Graham & White, 2016). Waste accumulation that is not correctly managed can transmit disease, and the regulatory model for household waste management suggests that community involvement is necessary to mitigate this (Colon & Fawcett, 2006). Thus, improving public awareness and concern about environmental cleanliness is crucial for promoting environmental health, and a neighborhood plays a big part in achieving it. More specifically, the head of the neighborhood unit can improve environmental health by utilizing the Waste Bank program (Miftahorrozi et al., 2022). The head of the neighborhood initiated this program by establishing a garbage bank, which not only helps clean up the environment but also reduces waste volumes in temporary landfills (Fatmawati et al., 2022). Additionally, communities can utilize existing resources to improve their quality of life.

The utilization of waste banks involves a variety of operations. To start with, the waste deposited in these banks is categorized into various types, such as organic and inorganic waste (Raharjo et al., 2018). The recycling of garbage, specifically organic waste, is an essential approach that can make it more useful in enhancing soil fertility. This recycling can be adopted at the household level to make homes more environmentally friendly (Czajkowski et al., 2017). The utilization of waste banks contributes significantly to community development, as they provide an opportunity for residents to participate in environmental cleaning and cost-saving initiatives (Wijayanti & Suryani, 2015). However, it is important to note that not all waste can be deposited into waste banks as it poses a risk of disease outbreaks due to being a breeding ground for disease vectors such as flies, mosquitoes, rats, and cockroaches. Therefore, effective waste management strategies should be employed to ensure that public health is not compromised. While there are various approaches to waste management, prevention is the most viable strategy. Raising awareness among people about the negative effects of littering can prevent the accumulation of garbage, promoting a cleaner environment. In conclusion, waste bank utilization provides numerous benefits to individuals and the community as a whole. However, proper waste management practices must be observed to ensure that harmful wastes are not introduced into waste banks.

To increase public awareness of household waste management, various models will be implemented. These include the activities of the neighborhood in realizing environmental hygiene and health, which is an essential component of waste management (McGranahan, 2015). In addition, efforts will be made to overcome obstacles that arise in the activities of the waste bank program. This program is aimed at improving environmental hygiene and health and its implementation is influenced by various driving and inhibiting factors, such as internal and external factors. To support waste management efforts, the Regency/City Governments have contributed many facilities and infrastructure. They are also cooperating with the private sector to ensure the mobility of waste bank operations. These efforts aim to increase public awareness of waste management, its importance, and the need for community involvement in maintaining cleanliness and environmental health. Lastly, the results achieved from the activities carried out by the neighborhood unit through the waste bank program will be evaluated. It will determine the success of the program in achieving its objectives. This evaluation will provide valuable insights into the effectiveness of the program and the necessary improvements to make it more efficient in managing household waste. This means that increasing public awareness of household waste management is crucial for maintaining cleanliness and a healthy environment. Collaborative efforts involving the government, private sector, and the community are fundamental to achieving this goal. The implementation of effective waste management programs, evaluation of results, and continuous improvement efforts are essential for sustainable waste management practices.

In terms of reducing the amount of waste generated from the source, one effective way to reduce the amount of waste generated is by implementing various measures at the source. This can include reducing the consumption of packaged goods, which in turn will reduce the amount of waste generated from the packaging material. It is also important to engage in waste segregation activities, as this directly reduces waste generation by sorting waste and separating it into recyclable and non-recyclable materials. Another way to reduce waste is to practice reusing and refilling items instead of disposing of them as waste. This not only reduces waste but also promotes sustainable practices. Participating in waste management planning and management is also crucial in reducing waste generation. Providing and utilizing waste management services can also be helpful. Additionally, people can participate directly in waste management by working in or supporting waste management and recycling efforts. Building a waste bank can also encourage people to adopt the 3R-based waste management system, which involves sorting and recycling based on economic benefits and public health (Putri et al., 2020). Finally, a culture of social control and mutual support can be instilled to promote waste reduction practices at all levels of society.

4.3. Public health-based waste management: A regulatory model

Modeling a sustainable framework in household waste management is an important initiative that is designed to help communities manage their waste in an environmentally sustainable and responsible manner. The model is built on a set of regulations and legislation that require local governments to work together with private sector partners to build waste processing facilities that can handle both organic and inorganic waste. Under the regulatory model, community members are given access to health and welfare insurance that allows them to take part in waste management programs. This includes training and education on how to sort and

dispose of household waste, as well as campaigns and leaflets that guide residents on proper waste management behavior. Local governments can partner with the private sector to establish waste management systems that are designed to preserve the environment and maintain a clean and healthy community. Waste reduction and handling programs are implemented by ensuring that local laws and regulations are enforced and that the community is educated on the proper disposal of waste. In addition, local governments can set up waste management units of local government to manage waste and establish incinerators that produce electrical energy. This helps communities to become more self-reliant and sustainable in dealing with their waste problems. Finally, community participation is encouraged through submissions to the regent through the local government working unit that handles waste management. This allows community members to voice their concerns and suggestions regarding waste management policies and practices (Saptomo, 2019). This means that establishing a sustainable household waste management regulatory model is important for ensuring that communities can manage their waste in an environmentally sustainable and responsible manner. With the proper education, training, and support, individuals and communities can become more self-sufficient in handling their waste while at the same time preserving the environment and maintaining a clean and healthy community.

In order to address the weaknesses in household waste management, there are several areas of emphasis that need to be considered from a legal perspective. Firstly, it is crucial to focus on the 3Rs — reduce, reuse, and recycle — in order to minimize the amount of waste being produced. From a legal structure perspective, the regional government must demonstrate its commitment to creating a clean and healthy environment by implementing regulations and sanctioning those who violate them. The local authorities should take decisive action against those who violate these regulations without being influenced by external parties. Additionally, the local government can provide training to local enforcement agencies' personnel to ensure their understanding of existing laws and regulations related to waste management.

Furthermore, it is important to change the culture of society to address the weaknesses in the legal culture aspect of waste management as one of three elements of the legal system from Friedman (1977). One way to do this is to conduct outreach to the community to inform them about local regulations and decrees related to waste management. Guiding the community with proper waste management procedures, including the separation of organic and inorganic waste, can also be effective. Incorporating waste management education into the school curriculum at all levels can ensure future generations understand the importance of the 3Rs and correct waste management practices. Additionally, routine outreach to communities living near rivers can help prevent garbage from being thrown into them. Organizing competitions to motivate the community to maintain a clean and healthy environment and optimizing the waste bank as a forum for the community to reuse waste can also improve overall waste management. Thus, a comprehensive approach that includes both legal and cultural aspects can help improve household waste management. This can involve implementing and enforcing regulations related to waste management, as well as educating and promoting good waste management practices in the community. Overall, the findings revealed that to improve household waste management regulations, a regulatory model based on public health should be implemented, and local governments should assert their responsibilities in enforcing the regulations, educating the public, and optimizing the use of the waste bank. Moreover, the legal framework should be strengthened to support the existing regulations.

To develop a regulatory model for household waste management that prioritizes environmental concerns and public health, there is a need to integrate existing laws and regional regulations that cater to the distinct needs of each district or city in Indonesia. To achieve this, revisions must be carried out in three stages. In the short term, the Indonesian government should quickly revise Law No. 18 of 2008 on Waste Management as well as regional regulations such as Semarang City Regional Regulation No. 6 of 2015, Kendal Regency Regional Regulation No. 13 of 2012, and Kendal Regency Regional Regulation No. 2 of 2014. This will provide the necessary regulatory framework to enhance waste management practices in the short term. In the medium term, the government should form a legal umbrella for waste management that incorporates Article 9, paragraph (1); Article 11, paragraph (1) of Law No. 18 of 2008 on Waste Management, and other relevant articles in regional regulations. By doing so, the government can ensure that all waste management practices are per existing regulations that prioritize environmental protection, efficiency, and legal compliance. In the long run, the government can consider several strategies to further improve waste management practices in Indonesia. First, landfills should no longer be the only repository for all types of waste but instead, only accommodate items that cannot be reused or repurposed. Second, optimizing temporary landfills with a 3R system, which processes waste into recycled materials, should be extended to households to ensure that waste is properly sorted and managed. Third, the skills and knowledge of optimizing temporary landfills with 3R and waste bank operators should be reinforced to ensure that they can provide valuable and appropriate assistance. Lastly, the government must reinforce its commitment and support for good waste management practices by providing appropriate funding, programs, and regulations that align with the principles of Law No. 18 of 2008 on Waste Management. By implementing these strategies, Indonesia can promote cleaner and healthier environments while also ensuring that waste management practices adhere to the appropriate regulations that drive efficiency, sustainability, and legal compliance.

5. CONCLUSION

The study revealed that a regulatory model for household waste management based on public health is required. This model emphasizes three main aspects to mitigate the current issues related to waste management. Firstly, it aims to increase

public awareness and concern towards keeping both the household and environment clean. Secondly, it focuses on reducing the amount of waste generated at the source, and thirdly, it aims to optimize the waste bank, which is a platform for the community to reuse waste, particularly inorganic waste such as plastic and paper, and improve the people's welfare. Furthermore, it was discovered that this regulatory model is under existing laws and regulations. However, certain areas of weakness need to be addressed to ensure that the waste management regulations are effective. In terms of legal substance, it is essential to emphasize certain aspects of laws and regulations to respond to current weaknesses in waste management. Whereas, from a legal structure perspective, specific measures have to be taken to address the deficiencies. To boost the people's compliance with waste management regulations, local governments have some duties to undertake. Firstly, socializing people about regional regulations or decrees issued by the local government is essential. This will help ensure that people are familiar with and follow proper waste management practices. Secondly, the government needs to guide the community on the appropriate waste management process, from collecting, sorting, and transportation to final waste processing. Thirdly, incorporating solid waste management into the education curriculum, starting from elementary, junior high, high school, and tertiary levels, will improve future generations' awareness and compliance. Fourthly, regular outreach to the community, especially those living on the riverbanks, is crucial to sensitize these communities against littering. Finally, optimizing the waste bank, which encourages the reuse of waste, especially inorganic waste like plastic and paper, will generate economic value and improve people's welfare.

The proposed regulatory model for household waste management with an environmental perspective based on public health involves short-term, medium-term, and long-term actions. In the short term, the Government of the Republic of Indonesia should revise existing waste management laws and regulations, such as Law No. 18 of 2008 on Waste Management, Semarang City Regional Regulation No. 6 of 2015, Kendal Regency Regional Regulation No. 13 of 2012, and Kendal Regency Regional Regulation No. 2 of 2014. This revision should happen as soon as possible to address the immediate issues of household waste management. In the medium term, the government should work with the legislature to establish an umbrella legal framework for waste management. This legal umbrella would provide a more comprehensive and standardized approach to household waste management. In the long term, several actions need to be taken. Firstly, the local government needs to build a waste processing industry factory, which would help address the growing problem of waste accumulation. Secondly, the temporary landfills with a 3R system (which includes reduce, reuse, and recycle) need to be connected down to the household level. Thirdly, the skills and knowledge of optimizing temporary landfills with 3R and waste bank operators need to be strengthened through training, not just through providing facilities or equipment. Finally, the government needs to commit to longer-term assistance to enable temporary landfills with 3R and the waste bank to operate independently and sustainably.

The study's findings hold significant implications for waste management in Indonesia. Firstly, the regulatory model emphasizing public health can heighten public awareness about cleanliness, potentially improving waste management practices and reducing waste generation at its source. Secondly, optimizing the waste bank offers a means for the community to reutilize inorganic waste, like plastics and paper, leading to economic benefits and enhanced well-being. However, limitations existing in the model's real-world implementation and effectiveness were not assessed, warranting further investigation. Additionally, the study's reliance on existing regulations might overlook legal gaps and inconsistencies, underscoring the need for more comprehensive legal exploration. Future research pathways include evaluating the model across different regions, exploring socio-economic influences on waste management behaviours, and innovating technologies like waste-to-energy systems or circular economy models to enhance sustainability in Indonesian waste management.

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