



The effectiveness of waste management policy governance in Indonesia: Between national targets and local achievements

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Received Date: June 19, 2025

Revised Date: August 26, 2025

Accepted Date: August 31, 2025

ABSTRACT

Background: The problem of waste management in Indonesia is still a serious challenge in realizing sustainable development. Although the government has set the Indonesia Clean Waste 2025 target through Presidential Regulation No. 97 of 2017 concerning the National Policy and Strategy on Household and Similar Household Waste Management (Jakstranas), the implementation achievements at the regional level have not shown optimal results. **Methods:** This article uses a descriptive qualitative approach with content and interpretive analysis of secondary data from policy documents, performance reports, and academic publications for the 2019–2024 period. The analytical framework integrates the policy implementation effectiveness model of George C. Edwards III (1980) and the Collaborative Governance model of Ansell & Gash (2007). **Findings:** The results of the analysis show that the effectiveness of the implementation of waste management policies in Indonesia is still low to moderate. The main obstacles include non-participatory policy communication, limited regional resources and funding, weak inter-agency coordination, and low participation of the community and the private sector. However, some areas, such as Surabaya and Bekasi, have shown relatively successful collaborative practices in encouraging public participation and local innovation. **Conclusion:** The effectiveness of the implementation of waste management policies in Indonesia cannot be said to be effective, either in achieving national targets or in their implementation at the local level. Facilitative leadership, inclusive institutional design, and transparent policy communication are needed so that national and equitable targets can be implemented at the local level. Another thing is that the governance of waste management policies is highly dependent on the power of multi-level collaboration between the central government, local governments, the private sector, and the community. **Novelty/originality of this article:** This article offers the integration of two governance models—Edwards III and Ansell & Gash—in analyzing the effectiveness of environmental policy implementation in Indonesia and providing practical lessons from Singapore's experience to strengthen cross-sectoral collaboration in waste management.

KEYWORDS: collaborative governance; Indonesia clean of waste 2025; policy effectiveness; policy implementation; waste management.

1. Introduction

The issue of waste remains a significant challenge in sustainable development governance at the global level. In the report *Global Waste Management Outlook 2024*, the United Nations Environment Programme (UNEP) estimates that the world's urban solid waste production will increase from around 2.1 billion tonnes in 2023 to 3.8 billion tonnes by 2050 if business conditions continue as usual. In addition, the direct costs of global waste

Cite This Article:

Firdausy, B. M. (2025). The effectiveness of waste management policy governance in Indonesia: Between national targets and local achievements. *Waste Handling and Environmental Monitoring*, 2(2), 133-149. <https://doi.org/10.61511/whem.v2i2.2025.3124>

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management are estimated to reach USD 252 billion by 2020 and could increase significantly if effective control measures are not taken (United Nations, 2024).

As the world's fourth-largest population with an ever-increasing urbanization rate, Indonesia faces complex challenges in managing waste (Wastec International, 2025). Based on data from the Waste Management Information System (*Sistem Informasi Pengelolaan Sampah Nasional*) (SIPSN), national waste generation reached around 32.9 million tonnes per year for 311 districts/cities, with 31.96% of the amount successfully handled and 33.16% managed, while around 66.84% of the remainder has not been managed properly (SIPSN, 2024). The composition of waste also shows that household waste still dominates—around 50.8% by 2024 (GoodStats, 2025).

In response to these problems, the Indonesian government launched Indonesia Clean Waste 2025 target (*Indonesia Bersih Sampah 2025*), which is part of the National Policy and Strategy for the Management of Household Waste and Similar Household Waste (*Strategi Nasional Pengelolaan Sampah Rumah Tangga dan Sampah Sejenis Sampah Rumah Tangga—Jakstranas*), as stipulated in Presidential Regulation Number 97 of 2017. This program targets a 30% reduction in waste and 70% handling by 2025. The policy strengthens the direction of Law Number 18 of 2008 concerning Waste Management, which previously emphasized a paradigm shift from the end-of-pipe management to the 3R principle—*reduce, reuse, recycle* (Kementerian PU, 2020). The implementation strategy of Jakstranas includes waste reduction at primary sources, reuse and recycling, as well as environmentally friendly handling and final processing. Local governments are also required to formulate similar policies at the local level so that their implementation is in line with the conditions of their respective regions (Blud, 2025).

However, after nearly a decade of implementation, the policy's achievements have not been evenly distributed. Some regions have shown relatively better performance, but many other regions have not reached the expected targets due to various obstacles. The latest data shows that the national waste reduction is still low (around 1.1-1.2%) and that the percentage of waste handled/managed is still in the range of 30-40%, far from the target. These obstacles include limited waste management infrastructure, inadequate regional institutional capacity, inadequate budget allocation, and low community participation (Blud, 2025; Metro Tv, 2025).

In fact, in some cities, management efforts from upstream to downstream have begun to be implemented to strengthen the local system. For example, in the city of Semarang, programs such as the movement of waste sorting, composting, eco-enzyme, and ecobrick, as well as a waste exchange program with basic necessities, have been carried out, accompanied by improvements in waste management infrastructure downstream. In Bantul Regency, there is also the development of an Integrated Waste Management Site (*Tempat Pengelolaan Sampah Terpadu—TPST*) and *Intermediate Treatment Facility* (ITF) (Detik News, 2025), as well as the construction of 3R processing facilities at the sub-district/village level as part of the local strategy (Antara News, 2025b). However, again, this cannot be said to have reached the target because only a few cities and even provinces, such as West Java and East Java, have shown significant achievements with waste handling volumes of 2.4 million tonnes and 2.7 million tonnes, respectively (SIPSN, 2024). This difference in achievement indicates that there is a gap between national targets and regional capabilities in implementing policies. These conditions show that the effectiveness of waste management policies is highly dependent on institutional capacity, inter-institutional coordination, and public support in the implementation process.

In the context of public administration, waste management policies are a shared responsibility between the central government, local governments, the private sector, and the community. Collaboration between stakeholders is a strategic approach to strengthening policy effectiveness and improving public services in the environmental sector. Research by Wicaksana et al. (2025) on collaborative systems in organic waste management in Lebak Regency shows that low cross-actor cooperation has a direct impact on the decline in management effectiveness. This shows that policy governance needs to be implemented in an integrated, adaptive, and mutually reinforcing manner between national

policies and local implementation, which is an urgent need. The flexibility of implementation in the regions allows policies to adapt to regional characteristics without neglecting national objectives.

This condition also confirms that the problem of waste management is not only technical but also a complex public policy governance issue. Study *Waste Management in Decentralized Indonesia: Policy Coherence and Multi-Level Governance in Yogyakarta* shows that the success of policies is greatly influenced by horizontal synergy between institutions and vertical coordination between central and regional governments (Yuwono & Hanani, 2025). In this context, the effectiveness of policy implementation is highly dependent on institutional capacity, resource availability, and community participation.

Conceptually, the effectiveness of policy implementation is not only measured by the achievement of formal targets but also by the ability of governance to coordinate actors, resources, and collaborative mechanisms that support its implementation (Amir et al., 2025). In this context, the study *Analysis of the Effectiveness of Policy Implementation Passenger Services* explained that there are four main variables that affect the effectiveness of policy implementation, namely communication, resources, the character or attitude of the implementer, and the organizational structure (Cahyadie et al., 2024). The concept, adapted from George C. Edwards III's theory (1980), serves as a reference for understanding the extent to which policies are able to achieve their goals through effective governance.

Based on this framework, this article seeks to fill the research gap by integrating the model of policy implementation effectiveness of Edwards III (1980) and the Collaborative Governance framework of Ansell & Gash (2007) to assess the governance of waste management policies in Indonesia. The aim is to analyze the extent to which collaboration between actors and cross-level coordination affect the effectiveness of national policy implementation towards the 2025 Indonesia Clean Waste target. This approach is expected to make a theoretical and practical contribution in strengthening sustainable collaborative governance in the environmental sector.

2. Methods

2.1 Research method

The research in this article uses a descriptive qualitative method to analyze the effectiveness of waste management policy governance in Indonesia. This approach was chosen because it is able to comprehensively describe policy phenomena through the interpretation of the social, institutional, and administrative context surrounding the implementation process. Ontologically, this research is based on the view that public policy is the result of dynamic interaction between actors in a complex system of government, while epistemologically, the research places the author as an active interpreter of meanings, relationships, and dynamics that arise from various secondary data sources. Thus, the results of the analysis not only explain the empirical conditions but also interpret how coordination, collaboration, and policy effectiveness are formed in waste management governance practices.

The data used is secondary data obtained from official and credible sources, including laws and regulations, policy documents, academic publications, and institutional reports. The main documents include Law Number 18 of 2008 concerning Waste Management and Presidential Regulation Number 97 of 2017 concerning National Policies and Strategies for the Management of Household Waste and Similar Waste of Household Waste (Jakstranas). In addition, quantitative and factual data from SIPSN for 2019–2024, performance reports of the Ministry of Environment and Forestry (KLHK), local government evaluation reports, and academic publications relevant to the topics of policy implementation effectiveness, environmental governance, and multi-level governance collaboration are also used. The 2019–2024 period restrictions were chosen so that the analysis remains relevant to the policy implementation phase towards the 2025 Indonesia Clean Waste target.

2.2 Analytical techniques and framework

The analysis techniques used are content analysis and interpretive analysis. The analysis is carried out systematically through three main stages. First, data reduction by identifying information related to the effectiveness of policy implementation, inter-stakeholder relationships, and forms of collaboration that occur at various levels of government. Second, the presentation of data in the form of thematic narratives to map the dimensions of policy effectiveness and collaborative elements that emerge. Third, drawing conclusions by interpreting the relationship between theory and empirical findings in order to obtain a comprehensive understanding of the governance patterns of waste management policies in Indonesia.

The analytical framework in this study integrates two main models. First, the model of policy implementation effectiveness of George C. Edwards III (1980), which emphasizes four main dimensions: communication, resources, the disposition or attitude of the implementer, and the bureaucratic structure. This model is used to assess the extent to which waste management policies at the national and regional levels have met the prerequisites for implementation effectiveness. Second, the Collaborative Governance framework developed by Ansell & Gash (2007) which highlights the role of starting conditions, institutional design, facilitative leadership, and collaborative processes in building cross-sector synergy.

The combination of the two models results in an integrative analysis between structural and relational aspects in policy governance. Through this merger, the research traces the extent to which the relationship between central and local government actors, the private sector, and civil society contributes to the success or obstacles of achieving national targets. This approach is expected to provide an in-depth understanding, transparent replication, and practical implications for strengthening collaborative governance in waste management in Indonesia.

3. Results and Discussion

3.1 Conditions and effectiveness of waste management policy implementation

The problem of waste management in Indonesia has not shown optimal results until now. Based on data from SIPSN, the total national waste generation reaches around 33 million tonnes per year, or the equivalent of 90 thousand tonnes per day (SIPSN, 2024). Most of this waste comes from the household sector, with the dominant composition being food waste, single-use plastics, and inorganic residues, as shown in Figure 1. This condition indicates that waste management policies are not effective at the source level, especially in the application of the 3Rs in households. In fact, the main goal of Jakstranas, as stipulated in Presidential Regulation Number 97 of 2017, is to suppress waste generation from its origin through efforts to reduce the source and strengthen the recycling system (Blud, 2025).

The data also shows that the national waste management paradigm is still oriented towards an approach. End of pipe—that is, treatment at the final stage through collection and disposal, rather than reduction at the source. As a result, the burden on Final Processing Sites (TPA) facilities continues to increase and shorten their operational life. On the other hand, the waste collection system in many areas still does not reach all areas, especially in suburban and rural areas, so some people still practice burning or illegal dumping (open dumping) (Mongabay, 2025). This phenomenon not only causes environmental pollution but also shows the weak implementation of decentralized waste management policies.

This problem was also highlighted by various stakeholders; the CEO of Waste4Change, for example, Mohamad Bijaksana Junerosano, emphasized that the root of the waste management problem in Indonesia lies in three main things: weak law enforcement against violations, the absence of concrete role guidelines among actors, and a disproportionate financing system (Kompas, 2023). In line with this, the Indonesian Environmental Experts Forum Association (*Perkumpulan Forum Tenaga Ahli Lingkungan Indonesia—PTALI*)

identified four main causes that make the waste problem unresolved, namely excessive consumption patterns, low public awareness, an unintegrated sorting system, and the slow process of waste biodegradation in the field (PTALI, 2025). The findings confirm that waste management problems in Indonesia are not only technical problems but also related to the effectiveness of public policy governance, which is still weak.

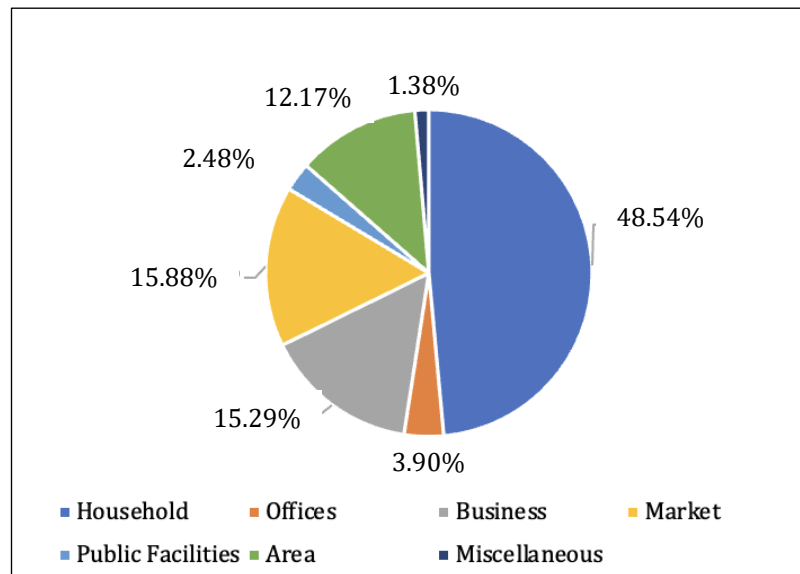


Fig. 1. Composition of waste based on waste sources in Indonesia (SIPSN, 2024)

National policies such as Jakstranas, which is a derivative of Presidential Regulation No. 97 of 2017, are actually designed to realize the vision of Indonesia Clean of Waste 2025 through increasing the role of the community, strengthening infrastructure, and cross-sector coordination. However, the results of its implementation in the field have not reflected the expected results. Many local governments face limitations in facilities, human resource capacity, and technical capabilities in integrated waste management. The results of a national survey conducted by GoodStats show that 62% of respondents consider the government's performance in dealing with waste problems still low, especially in the aspect of supervision and law enforcement (GoodStats, 2024). This data shows that there is a gap between policies at the central level and their implementation at the local level.

Suasono et al. (2023), deep The Effectiveness of Plastic Waste Management Based on the Legal System in Indonesia shows that the effectiveness of plastic waste management in Indonesia is still low due to weak underlying legal and governance systems. Other factors that also affect this are the lack of coordination between levels of government, low public awareness, and a lack of industrial responsibility in the application of the principles of Extended Producer Responsibility (EPR). Many regions have also not translated national policies into concrete local regulations, resulting in inconsistent law enforcement. This situation shows that the effectiveness of waste management policies still faces challenges in terms of policy communication, resource availability, implementer disposition, and bureaucratic structure. The lack of participatory communication directly influences the implementers' disposition and weakens inter-agency coordination, indicating that weaknesses in one dimension of implementation can trigger inefficiencies in others. This interconnectedness highlights that policy effectiveness must be viewed as an integrated system rather than isolated variables. Referring to the policy implementation effectiveness model from Edwards III (1980), policy effectiveness is strongly influenced by four main factors, namely communication, resources, disposition (implementing attitude), and bureaucratic structure. Analysis of these four factors shows the following conditions.

Table 1. Aspects of effectiveness and conditions of implementation of waste management policies in Indonesia

Effectiveness factors (Edwards III, 1980)	Conditions for the implementation of waste management policies in Indonesia
Communication; The process of conveying information by the communicator to the audience	The delivery of government information to the public is generally still in the form of public appeals and short campaigns. Participatory communication strategies involving local communities have not been consistently implemented (Antara News, 2025a).
Resources; Elements that support and support the sustainability of policy implementation, ranging from human resources, budgets, equipment, and authority	Human resources and budgets to support policies are still limited. The government is the dominant actor, while the private sector has not been fully involved in management and financing (Low Carbon Development Indonesia, 2024).
Disposition/Attitude of the Implementer (<i>Disposition</i>); Disposition refers to a strong commitment to implementing related policies by the actors involved.	The commitment of policy implementers is still partial. Governments are often reactive to waste problems and adjust targets when implementation is not effective, instead of strengthening efforts to achieve the original goal (Kementerian PU, 2025).
Bureaucratic <i>Structure</i> ; Integration of governance between parties in carrying out related policies.	Coordination between agencies and between levels of government has not been built in an integrated manner. Policy flexibility at the regional level actually causes inconsistencies between regions, with implementation that is not always in sync with central policies (Kementerian PANRB, 2024).

Based on these four factors, the effectiveness of policy implementation can be assessed through four main dimensions: achievement of policy targets, consistency between regions, implementation barriers, and participation of the community and the private sector. First, in the context of achieving the target, Presidential Regulation Number 97 of 2017 affirms the target of reducing waste by 30% and handling residual waste by 70% by 2025. However, until 2024, the national achievement will only reach 1.19% for reduction and 31.96% for handling due to weak efforts. Waste segregation at the source and the lack of recycling facilities in the regions so that some of the collected waste still ends up in landfills without a sorting process. This achievement shows a significant gap between the policy target and the implementation results (SIPSN, 2024).

Second, from the aspect of consistency between regions, each region is required to compile a Jakstrada as a derivative of national policies. Although this policy provides room for adaptation to the local context, this flexibility actually creates inequalities in the effectiveness of waste management between regions (Antara News, 2025c). Therefore, special attention is needed and the affirmation of collaboration mechanisms and harmonization of regulations at the regional level so that the implementation of policies remains in line with national goals so that some regions with low institutional capacity do not stagnate due to weak coordination and dependence on central support.

Third, the main obstacles to implementation lie in the lack of sustainable funding, weak monitoring mechanisms, and low technical capacity of local officials (UGM News, 2025). Meanwhile, fourth, community and private sector participation is still sporadic. Recycling and waste sorting initiatives are more likely to emerge from community movements than from systematic government policies (Unikom Website, 2025). The following is a clearer picture of the overall implementation results. Table 2 summarizes the current policy effectiveness levels in the four dimensions identified earlier.

Based on these findings, it can be concluded that the effectiveness of waste management policy implementation in Indonesia is currently low to moderate. The combination of weak communication, limited resources, and fragmented coordination shows that structural and behavioral aspects of policy governance are still disconnected. Strengthening these relationships through multilevel collaboration is essential before

moving on to the next stage of analysis. National policies have not been fully decentralized in an adaptive manner, while cross-sectoral coordination remains weak. In order to realize a Clean Indonesia 2025, it is necessary to strengthen legal and institutional aspects, increase the capacity of local officials, and create more open collaborative mechanisms between the government, the community, and the industrial sector. Only with synergistic and inclusive governance can the effectiveness of waste management policies be improved sustainably and respond to future environmental challenges.

Table 2. Summary of policy effectiveness assessment (2024)

Indicator	Current condition	Effectiveness level
Target Achievement	1.19% reduction; 31.96% handling (SIPSN, 2024)	Low
Regional Consistency	Uneven across provinces; depends on institutional capacity	Moderate
Implementation Barriers	Persistent funding and HR limitations	Low
Stakeholder Participation	Fragmented and unsustainable	Moderate
Overall, Policy Effectiveness	Low to Moderate	

3.2 Multi-level collaboration in the implementation of waste management policies

The discussion of the effectiveness of waste management policy implementation in the previous subsection shows that two main factors—communication and bureaucratic structure—are still crucial obstacles in achieving national policy targets. These two factors are actually rooted in one fundamental issue, namely the level of collaboration between policy actors. This collaboration is not only important vertically between central and local governments but also horizontally between governments, communities, the private sector, and epistemic communities such as academics and research institutions. In other words, the problem of implementing waste management policies in Indonesia is not only caused by weak implementation in the field, but also because collaborative governance across levels of government and between policy actors is not optimal.

Various previous studies, such as *The Analysis of Household Waste Management Based on Integrated Sustainable Waste Management in Sungailiat City (2022)*, emphasize that the success of household waste management is highly dependent on three main elements: integration between national and local policies, the availability of adequate funding, and the consistency of local governments in conducting public education. The study also highlights that the involvement of the private sector and academia can no longer be seen as complementary, but rather as an integral part of a sustainable waste management system. In other countries such as Japan and South Korea, multi-level collaboration is the backbone of the success of the 3R system and circular economy because it is able to connect the roles of government, industry, and society synergistically in one integrated policy framework.

In this context, the concept of Collaborative Governance presented by Ansell & Gash (2007) is relevant to explain how multi-level collaboration can strengthen the effectiveness of waste management policy implementation. Ansell & Gash (2007) define collaborative governance as a governance arrangement in which one or more public institutions work together with non-government stakeholders in the process of formulating and implementing public policies. The model developed by Ansell & Gash (2007) includes four main elements that interact with each other, namely starting conditions, institutional design, facilitative leadership, and collaborative process. These four elements make up the virtue cycle, which is characterized by increased trust, commitment, and mutual understanding between the parties.

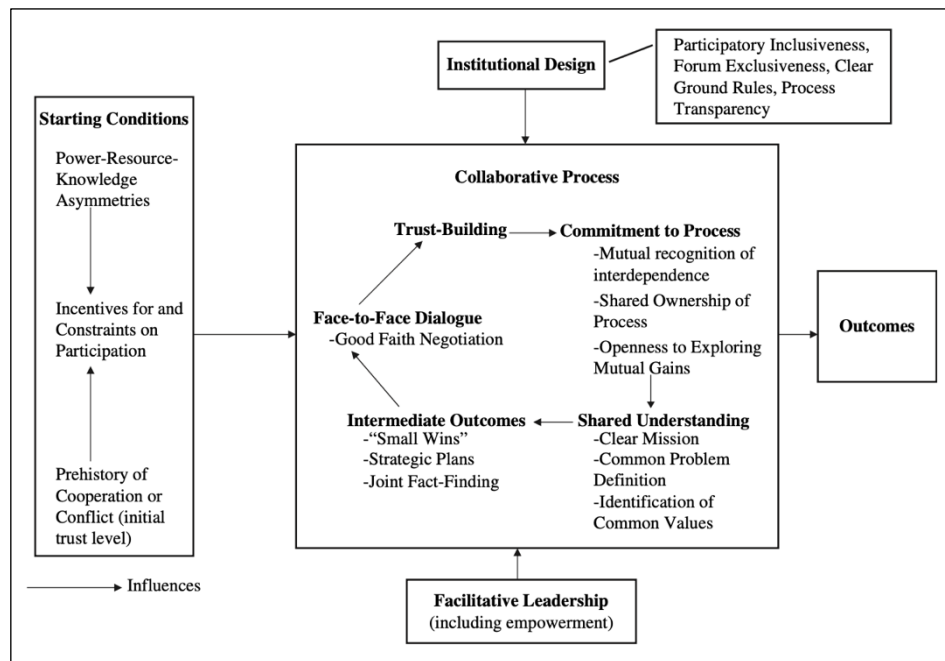


Fig. 2. A Model of collaborative governance framework (Ansell & Gash, 2007)

Starting from the starting conditions, the implementation of waste management policies is a national decision directed to reduce waste generation through reduction and sorting at the source. The central government sets policies through Jakstranas (Perpres No. 97 Tahun 2017) and asks each local government to prepare a Jakstrada according to the local conditions of each (Blud, 2025). This policy flexibility should allow policy adaptation to regional characteristics, but in practice, it creates discontinuity between the central and regional governments. Inequality of capacity, resources, and experience between regions creates power asymmetry (power-resource-knowledge asymmetries) that hinders the active involvement of local governments in policy formulation and implementation. In addition, a history of weak cooperation and a low level of trust between actors make it difficult to build collaborative processes from the early stages (Greeneration Foundation, 2024).

Next, institutional design plays an important role in determining the success of the collaboration. Institutional design of national policies, such as Jakstranas, has provided a general direction for waste reduction and handling, but the collaboration mechanism in it has not been clearly defined. The interagency coordination forum is still sectoral and not fully inclusive for non-government actors. The decision-making process often takes place in a systematic top-down manner without involving the community, the driving community, or academics in any meaningful way (Tempo, 2025). In fact, the Collaborative Governance model emphasizes that an open, transparent, and participatory institutional design is the basis for the formation of trust (trust-building) and mutual commitment between actors.

The third factor is facilitative leadership, which plays a role in maintaining the integrity of the collaborative process and empowering all parties involved. In the context of waste management in Indonesia, the government's role should not stop at being an administrative facilitator, but also including being a leader who is able to mediate the interests of inter-actors, mobilize community participation, and ensure that each party has equal space to contribute. However, the reality on the ground shows that many regional leaders still see waste management as a technical matter of cleanliness, not as a strategic agenda for sustainable environmental development (ISWMP, 2025). This hinders the creation of transformative and inclusive leadership as outlined in the Ansell and Gash model.

The last element, Collaborative Process, is at the heart of collaborative governance itself. This process includes face-to-face interactions, building trust, developing commitment, and creating mutual understanding. In Indonesia, the communication pattern

in waste management is still dominated by a hierarchical approach, not a participatory dialogue (IAP2, 2025). Nonetheless, there are a number of good practices at the local level that point in the direction of positive change.

The city of Surabaya is one of the examples of successful implementation of collaborative governance; successful waste management encourages collaboration that is not only around the government and the community, but also the involvement of the waste bank community and local business actors as well. Local governments play the role of facilitators who not only ensure the transparency of the program but also provide a space for the community to innovate. This collaboration gave birth to a waste reduction incentive system and community-based circular economy partnerships that significantly increased citizen participation (Pemkot Surabaya, 2025). Meanwhile, in Bekasi, the local government intensifies waste management and handling through the optimization of waste banks. Through this program, the Bekasi City Government not only collects waste but also processes it into valuable products for sale. Its implementation is fully supported by the government, by provides grants in each RW (Kompas, 2025). The scheme demonstrates how the synergy between public policy and the private sector can create innovative solutions in reducing the burden of waste generation while supporting a sustainable energy transition. These finding reflects the element of facilitative leadership in the Ansell & Gash model, where the local government acts as a mediator between citizens and the private sector, ensuring inclusion and shared ownership in the waste management process.

Both examples illustrate variations of effective collaborative models in Indonesia, where their effectiveness is strongly influenced by social context, institutional capacity, and regional leadership. These variations in approaches suggest that there is no single model that can be applied uniformly across regions, but rather that each region needs a collaborative strategy tailored to its local characteristics and potential. The following is the total data on waste handling and reduction nationally, which reflects the results of policy implementation until 2024.

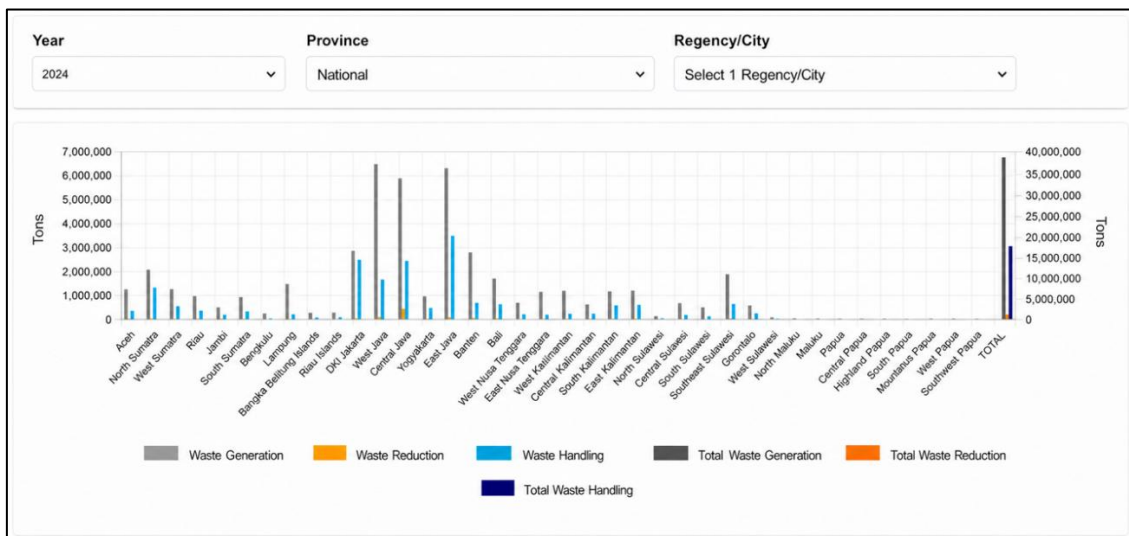


Fig. 3. Waste management performance achievements national in 2024 (SIPSN, 2024)

Intermediate outcomes from collaboration in several regions show the importance of shared understanding and shared ownership in the policy process. Regions that are able to build a shared vision between the government, communities, and the private sector tend to be more successful in developing local innovations and maintaining the sustainability of waste management programs. Conversely, in areas that do not yet have a common understanding of values and goals, policies tend to stop at the administrative level without producing substantive changes on the ground.

Thus, the application of the collaborative governance model of Ansell & Gash (2007) provides an understanding that the effectiveness of the implementation of waste management policies in Indonesia is highly dependent on the strength of the collaborative process built from the beginning. Collaboration based on trust, commitment, and shared values and goals is believed to bridge the gap between national targets and the reality of local implementation. This approach emphasizes that waste management is no longer just a technical hygiene affair but part of an adaptive, inclusive, and sustainable environmental governance strategy.

3.3 Learning collaborative practices of waste management in Singapore

Before going any further, it is interesting to review waste management practices in Singapore, which are often used as a reference in global environmental governance. The country occupies the top position in the effectiveness of solid waste management systems, both at the Asian and world levels. Based on the report Environmental Performance Index (EPI) published by Yale University and Columbia University (2024), Singapore is ranked first in the world in the category Waste Management with a score of 75.5 and achieved a perfect score of 100 on the sub-indicator Controlled Solid Waste. This achievement shows that all waste generation in Singapore is recorded, managed, and processed through a fully controlled monitoring system.

Data from the National Environment Agency (NEA) shows that by 2024, Singapore will produce around 6.66 million tonnes of solid waste, with 3.33 million tonnes of which will be successfully recycled. The composition reflects a relatively stable balance between the processing capacity and the volume of waste generated each year. Most of the recycling activities come from non-domestic sectors such as industrial and commercial, while the domestic recycling rate is still a challenge due to the low awareness of households in the sorting of waste at the source (National Environment Agency, 2025).

Singapore's success in achieving an efficient waste management system is inseparable from a combination of stringent regulations, integrated infrastructure, and effective collaborative governance. In the aspect of law enforcement, the government implements a strict sanction system against waste management violations. Based on the report by The Straits Times (2024), perpetrators of public hygiene violations, such as littering, can be fined between SGD 2,000 and SGD 10,000 (equivalent to Rp25–100 million), depending on the level of the offense committed. In addition, the government cooperates with the courts through the implementation of Corrective Work Order (CWO), which requires offenders to clean public areas for a maximum of 12 hours as a form of social education and environmental responsibility (Channel News Asia, 2024). In other words, the Singapore government does not discipline society through a reward but rather a sanction that clearly provides a deterrent effect.

Singapore's Ministry of Sustainability and the Environment (MSE), together with the NEA, also carried out an approach-controlled waste flow, which is a comprehensive control system for the flow of waste from the source to the final stage of processing. All waste collection, transportation, and processing activities are required to have an official permit and are reported periodically to the NEA to ensure transparency, data accuracy, and prevention of illegal disposal practices and Open dumping. This oversight mechanism ensures that each waste-producing entity, whether individual or industrial, is fully responsible for the waste they generate (Ministry of Sustainability and the Environment Singapore, 2025; National Environment Agency, 2025).

On the other hand, these successes are also driven by the active role of the private sector and the community in the national waste management system. The government implements the policy EPR, which requires manufacturers and distributors to be responsible for the collection and treatment of post-consumer waste, especially for electronic, packaging, and plastic products. This policy is carried out through the Resource Sustainability Act (RSA) of 2019, which requires every producer to be a member of the Producer Responsibility Scheme (PRS) as well as report the number of products circulating

and managed every year (National Environment Agency, 2025). This approach creates a sustainable cycle of environmental responsibility along the production and consumption chain.

Cross-sector collaboration is also strengthened through the Sustainable Singapore Blueprint (SSB), a national strategic framework that brings together the vision of government, industry, academia, and society in achieving the goals of the Zero Waste Nation. Blueprint serves as a policy instrument that affirms the importance of public participation and collective responsibility in maintaining environmental sustainability. Under the umbrella of SSB, cross-stakeholder collaboration and research forums are routinely conducted to ensure that any environmental policy formulated is participatory, evidence-based, and integrated across sectors (Sustainable Singapore Blueprint, 2024).

When analyzed using the policy implementation effectiveness framework of Edwards III (1980), the waste management system in Singapore shows optimal performance in four main dimensions, namely communication, resources, implementing disposition, and bureaucratic structure. Policy communication is carried out openly through a consistent public reporting system and educational campaigns so that the public understands their roles and obligations. Resources that include processing infrastructure, funding, and technical personnel are managed professionally and sustainably. The attitude of the implementers is reflected in the high commitment of public officials and industry players to national targets, while the bureaucratic structure is arranged in a hierarchical but adaptive manner, with the NEA acting as the main coordinator that ensures synergy between government agencies and the non-governmental sector.

In the perspective of Collaborative Governance put forward by Ansell & Gash (2007), waste management practices in Singapore show strong application of the four key elements of the model, namely starting conditions, institutional design, facilitative leadership, and collaborative Process. The long history of law-based environmental governance and high public trust are the initial foundation for successful collaboration. Inclusive institutional design allows the public, private, academic, and community sectors to play an active role in the policy formulation and implementation process. The government's facilitative leadership plays a role not only as a regulator but also as a mediator and incentive provider for those who support green innovation. Meanwhile, the collaborative process is realized through regular meetings, transparent reporting, and face-to-face interactions that build a sense of shared ownership on environmental policy.

From Singapore's experience, there are a number of important lessons that Indonesia can adapt. The Indonesian government needs to strengthen the national waste flow data and control system by building an integrated reporting platform like the controlled waste system in Singapore. In addition, strengthening cross-sector partnerships and the application of EPR principles can be effective strategies in increasing industrial responsibility and reducing the burden on governments. Increasing the capacity of waste processing infrastructure in various regions also needs to be prioritized so that national policies do not stop at the regulatory level but can be implemented evenly at the local level.

Overall, Singapore's experience shows that the effectiveness of waste management policies depends not only on regulation and technology but also on cross-actor collaboration, visionary leadership, and transparent policy communication. A collaborative and data-driven approach allows the country to maintain consistency between national policies and local practices. By adapting these practices contextually, Indonesia has the opportunity to strengthen its collaborative governance towards a more effective, inclusive, and sustainable waste management system, in line with Indonesia's Clean Waste 2025 vision.

3.4 Implications and lessons learned from waste management policies in Indonesia

Based on the results of the analysis and discussion in the previous section, the effectiveness of waste management policy governance in Indonesia still faces various fundamental challenges. The achievement of policies that are not optimal shows that the

problem lies not only in the technical aspects of management but also in the weak coordination between levels of government, limited institutional capacity, and low collaborative commitment between policy actors. The gap between the national targets set in the Jakstranas and the realization at the regional level indicates that decentralization has not been fully followed by equitable distribution of resources, financing support, and adaptive institutional mechanisms. Without this support, waste management policies will find it difficult to achieve the implementation effectiveness as expected.

This condition provides an important lesson that national policies cannot be applied uniformly throughout Indonesia, which has different social, economic, and geographical characteristics. Policy decentralization needs to be balanced with affirmative policies from the central government in the form of technical assistance, knowledge transfer, and performance-based budget support. Decentralization is not only the delegation of administrative authority but also the delegation of proportional responsibilities, followed by a joint supervision and evaluation mechanism. Thus, the direction of national policy needs to be accompanied by adaptive and local context-based governance so that decentralization truly functions as an instrument of regional empowerment, not just a formality of dividing government affairs.

When compared to waste management practices in Singapore, it can be seen that the effectiveness of policies is greatly influenced by the government's ability to build cross-actor coordination and data-driven monitoring systems. Singapore has succeeded in creating an efficient waste management system through a combination of strict regulation, facilitative leadership, and inclusive institutional design. This approach is in line with the Collaborative Governance framework put forward by Ansell & Gash (2007), where effective collaboration is built on the basis of trust, open communication, and mutual commitment between policy actors. In the Indonesian context, these principles can be translated through the establishment of a transparent data governance system and cross-sector communication forums that allow for the continuous exchange of information.

In addition, Singapore's experience also demonstrates the importance of implementing EPR and data-driven governance approaches as environmental monitoring and accountability mechanisms. The implementation of a similar system in Indonesia can strengthen the communication and resource dimension in the policy effectiveness model of Edwards III (1980), as it allows the tracking of waste data from source to final processing. Data transparency not only improves the accuracy of policy planning but also strengthens public trust in the government in addressing environmental issues. In addition, incentive systems and partnerships with industry can also encourage private sector involvement in infrastructure investment and waste management innovation.

The results of the discussion show that the success of waste management policies does not depend on one actor or level of government alone, but on the strength of sustainable multi-level collaboration. A cross-actor collaborative forum that connects the central government, local governments, the private sector, academia, and the community needs to be established as a forum for information exchange and evidence-based policy evaluation. The forum serves not only for administrative coordination but also as a means of strengthening institutional capacity and developing data-driven regional innovations. Through this approach, the government can standardize performance indicators between regions, ensure a fair distribution of resources, and clarify the roles and responsibilities of each actor in the national waste management system.

These findings also confirm that inclusive collaboration has the potential to produce small wins in the form of local innovations, such as the development of digital waste banks, waste-to-energy, and community-based circular economy models. Although limited in scale, these practices serve as a catalyst for changing people's behavior and increasing collective awareness of environmental issues. As shown in the research of Wandira, Susanti, and Hans (2025), community-based programs that directly involve the community are able to increase their sense of belonging (sense of ownership) and strengthen public trust in environmental policies.

Based on all of these analyses, there are several important policy implications for Indonesia. The government needs to strengthen vertical and horizontal coordination between the central government, the local governments, and the non-governmental sectors so that national policies can be translated contextually according to local needs. In addition, the establishment of inclusive and data-driven cross-actor collaborative forums should be a priority in supporting sustainable policy evaluation. Efforts to increase public education and participation must also be carried out through direct communication and community-based programs, considering that the household sector is still the largest contributor to national waste generation.

Conceptually, the lessons learned from the results of this analysis confirm that public policies with national objectives should not be centrally oriented. The diversity of regional conditions demands a decentralized approach that is fair, adaptive, and based on collaboration. By strengthening commitment, coordination, and measurable evaluation of implementation effectiveness, waste management policies in Indonesia can move towards collaborative governance that unites the interests, resources, and shared values of the interactors. Collaboration across sectors and across government levels is the main key for Indonesia to get out of the growing waste crisis while realizing the target of Indonesia Clean Waste 2025 in a real, measurable, and sustainable manner.

Based on the results of the analysis and discussion that have been carried out, it can be concluded that the effectiveness of waste management policy governance in Indonesia still faces significant challenges, both in terms of planning, implementation, and coordination across levels of government. Although the national policy direction through Jakstranas has provided strategic guidance towards the Indonesia Clean Waste 2025 target, the implementation achievements at the local level have not been in line with the set targets. Based on SIPSN data, the waste reduction rate has only reached 1.19%, while the handling is 31.96% of the national target. This achievement shows that the effectiveness of policy implementation is still in the low-to-medium category and has not been able to close the gap between national policies and the reality of implementation in the regions.

The gap is caused by several key factors. First, there is still weak coordination between the central and regional governments, which results in national policies not being fully integrated into regional policies (Jakstrada). Second, limited institutional capacity and resources at the regional level hinder the optimization of policy implementation, especially in the aspects of resource-based management and recycling. Third, the participation of the community and the private sector is still sporadic, so the responsibility for waste management tends to be centralized with the government. Fourth, the policy flexibility provided within the framework of decentralization has not been followed by strong oversight and accountability mechanisms, resulting in variations in effectiveness between regions. Thus, the effectiveness of policies is determined not only by the quality of regulations but also by the ability of governance to establish coordination, communication, and collaboration across actors consistently.

Based on the results of the analysis using the Collaborative Governance model proposed by Ansell & Gash (2007), the effectiveness of the implementation of waste management policies in Indonesia is greatly influenced by four main elements, namely starting conditions, institutional design, facilitative leadership, and collaborative process. These four elements have not run optimally in the Indonesian context. Limited institutional capacity causes the initial conditions of collaboration to be unbalanced; institutional design is still sectoral; facilitative leadership has not been consistent across all regions; and collaborative processes often stop at the administrative stage. Thus, strengthening these four aspects is the key to increasing the effectiveness of national waste management policies.

4. Conclusions

In the theoretical framework of the effectiveness of policy implementation according to Edwards III (1980), improvements also need to be focused on four dimensions:

communication, resources, implementing disposition, and bureaucratic structure. The central government must ensure that national policies are communicated clearly and can be understood by all stakeholders in the regions. On the other hand, local governments need to increase the capacity of human resources and budgets, as well as foster the commitment of policy implementers to be more adaptive to local needs. Bureaucratic structures that are too hierarchical also need to be simplified so that cross-sector coordination can run faster and be responsive to dynamics in the field. From the lessons learned from international practice, as Singapore's experience shows, it can be seen that the effectiveness of waste management is highly dependent on data-driven governance, robust regulation, and the active involvement of all parties through a sustainable collaborative approach. Indonesia can adapt these principles by building a nationally integrated waste reporting system, expanding the implementation of EPR, and strengthening the role of communities in the local circular economy system.

Practically, there are several recommendations that can be made. The central government needs to establish a national collaborative forum that brings together local governments, the private sector, academics, and the community as a forum for data exchange, evaluation, and policy innovation. Local governments should strengthen internal governance and expand partnerships with communities and businesses, while communities need to be encouraged through continuous education to play an active role in household waste management. The synergy between these three actors will create a more inclusive and effective waste management system. Thus, the effectiveness of waste management policies in Indonesia is not only determined by regulations and planning at the national level but also by the ability of all actors to collaborate in an adaptive, transparent, and sustainable manner. Success towards Indonesia Clean Waste 2025 depends on a shared commitment to strengthening vertical and horizontal coordination, increasing regional institutional capacity, and building collective awareness that waste management is a shared responsibility to maintain environmental sustainability.

Acknowledgement

The author would like to thank the Administrative Science Study Program, Faculty of Administrative Sciences, University of Indonesia for the enlightenment and scientific deepening opportunities for the author. Appreciation was also given to the SIL UI research cluster recruitment team for providing the opportunity to compile this article as part of the Research Assistant recruitment process.

Author Contribution

Individual authors pay attention to the ethics of writing scientific papers, contributing fully to the entire research process, including conceptualization, data collection and analysis, manuscript writing, and final editing.

Funding

This article does not receive funding support from any government, private, or nonprofit organization.

Ethical Review Board Statement

This article does not involve human participants directly and does not require formal ethical approval from the research ethics committee.

Informed Consent Statement

It is not valid because this article is based on secondary data and public policy analysis without involving individual respondents.

Data Availability Statement

The secondary data used in this article is sourced from the National Waste Management Information System (SIPSN), official government reports, and publicly accessible scientific publications.

Conflicts of Interest

The author declares that he has no conflict of interest related to the research, writing, or publication of this manuscript.

Declaration of Generative AI Use

The author uses the help of artificial intelligence technology (generative AI) on a limited basis for grammar editing and sentence structure to be in accordance with the rules of academic writing. All ideas, analysis, and interpretations in the manuscript are the result of the author's thoughts and responsibilities.

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