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Research Article

Decentralization and the Transformation of Solid Waste Governance in Sleman Regency: A Preliminary Review

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Abstract
The solid waste issue has become a significant concern in the Special Region of Yogyakarta following the closure of the Regional Final Disposal Site (TPA) Piyungan in 2024. This closure led to a shift in waste management governance from a centralized provincial level to a decentralized approach at the city/regency level. Despite this shift, there is a lack of comprehensive literature explaining the governance models at these local levels. In response to this situation, this paper aims to explain the transformation of waste governance modes, specifically in Sleman Regency, following decentralization. By employing Kooiman's concept of governance, waste management issues are not merely technical problems; they can be viewed through the lens of actor interaction within an ecosystem framework, amidst complex and limited circumstances. This research employs a qualitative method to describe and compare the governance modes that have emerged following decentralization. The study involves interviews with key stakeholders, including the Sleman Environmental Agency (DLH), employees of the Integrated Service Unit (UPT), personnel from the Integrated Waste Treatment Site (TPST), community-run 3R waste facilities, village-owned enterprise waste sites, private waste disposal sites, and depot operators. The research reveals that in the current state, Sleman's governance model simultaneously reflects hierarchical governance, co-governance, and self-governance, which remain unbalanced and fragmented. This condition is mainly due to policy limitations, constrained resources, and the inherent complexity of solid waste issues. These findings aim to contribute to the discourse on improving solid waste governance, particularly regarding governability issues at the local level, providing insights into enhancing the management of waste systems within the region.

Keywords: *decentralization, landfill, mode governance, solid waste*

INTRODUCTION

Improving waste governance has become a national priority in Indonesia, reflecting the increasing complexity of waste management challenges in major urban centers. The waste emergency not only threatens environmental quality but also poses significant social, health, and economic risks, necessitating governance approaches that are more adaptive and inclusive. In recent years, several initiatives have introduced innovative models of collaborative governance. Examples include the strengthening of local government and non-state actor roles in Bali (Ain et al., 2021), cross-sectoral partnerships in Pekanbaru (Saputra et al., 2025), and community engagement through the Waste Donation Movement in Yogyakarta (Yandri et al., 2023). These practices suggest that decentralization can create opportunities for social innovation and broader community participation in waste governance. However, such initiatives remain unevenly distributed across the country. Some regions continue to face significant challenges, such as weak stakeholder synergy among government, private sector, and civil society actors, as observed in Makassar (Latanna et al., 2023). At the same time, both physical infrastructure, such as recycling facilities and integrated waste processing sites, and social infrastructure, including regulations, institutional capacity, and

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public awareness, remain inadequate (Mayasari et al., 2025). While existing best practices provide valuable lessons, stronger governance will require consistent policies, adequate resources, and the development of more sustainable collaborative models.

A case that has recently gained attention is the Special Region of Yogyakarta. The closure of the Piyungan Regional Landfill, after more than 28 years of operation serving Yogyakarta City, Sleman Regency, and Bantul Regency, marks a significant shift from a centralized to a decentralized model of waste management. This shift, however, has created new challenges for the local governments that previously relied on the landfill. Globally, decentralization has emerged as a key trend in waste management over the past decade, often integrated with climate change mitigation policies and more efficient resource utilization. Studies show that decentralized approaches can reduce landfill dependence by up to 50% while supporting more sustainable land-use policies (de Souza & Drumond, 2022). In Indonesia, the approach has gained increasing relevance with the country's rapid urbanization, where more than 60% of the population resides in urban areas, underscoring the need for localized waste management systems closely connected to communities (Massoud et al., 2021).

However, in Sleman and its neighboring areas, decentralization has disrupted the existing waste management chain, from households to landfills. The situation has been likened to a “chicken without its mother”: no clear short-term schemes have been offered by local governments to address the crisis. As a result, waste collection and processing services operated by TPS3R units and field operators have stalled in the absence of a final disposal site. This has led to the accumulation of waste at households, transfer depots, and even on major roads, such as the Ring Road. In many cases, waste has been dumped in open spaces, riverbanks, or paddy fields, generating new illegal disposal sites. Previous literature highlights the potential of decentralized approaches to strengthen community participation and improve environmental outcomes. Comparative cases, such as those in Lebanon and Saharanpur, demonstrate that community-based waste management can deliver sustainable and locally efficient solutions (Ansari et al., 2024).

Against this backdrop, the Sleman Regency Government is required to undertake a fundamental reset of its waste governance system to mitigate both environmental impacts and socio-economic risks. This transformation extends beyond technical adjustments and requires the reconstruction of governance systems that promote institutional innovation, community participation, and policy continuity (Latanna et al., 2023). Sleman’s longstanding reliance on the Piyungan Landfill has made its closure a critical turning point, forcing the local government to explore alternative strategies (Mayasari et al., 2025). Potential pathways include strengthening waste processing facilities at the village/kelurahan level, enhancing the capacity of local institutions, and creating economic incentive mechanisms to encourage households and communities to engage in waste reduction and separation actively (Yandri et al., 2023).

In this process, collaboration and synchronization among stakeholders are crucial. The local government must orchestrate the involvement of diverse actors with different interests: the private sector, which prioritizes efficiency and profit; community organizations, which emphasize social participation and collective values; and government institutions, which hold regulatory authority and public service responsibilities (Ain et al., 2021; Saputra et al., 2025). Achieving coherence among these actors requires not only operational coordination but also consensus on long-term visions, a precise distribution of roles, and shared accountability mechanisms. Ultimately, establishing an adaptive, inclusive, and sustainable governance framework is essential for Sleman to effectively address its current waste management crisis (Latanna et al., 2023).

Building on this background, the present study aims to examine the waste governance model in Sleman Regency in the aftermath of decentralization. Specifically, it seeks to analyze the interaction logics among stakeholders that shape governance structures—whether hierarchical,

market-oriented, network-based, or hybrid. From these structures, the study further investigates the emerging modes of governance, while also identifying the complexities and key challenges facing Sleman's waste management today.

LITERATURE REVIEW

The concept of *waste governance* has become a central focus in institutional efforts to improve waste management, both in developed and developing countries. Waste governance represents an approach that seeks to develop waste management and policy through the involvement of diverse structures, institutions, policies, practices, and actors (Gutberlet et al., 2020). It can also be understood as the interaction of stakeholders, encompassing decisions on waste management, supporting regulations, organizational structures, and the broader impacts of these decisions on waste systems (Cruz-Paz et al., 2023). In essence, waste governance is designed to establish a comprehensive and sustainable framework that protects public health and the environment, preserves resources, promotes innovation, and fosters inclusive and collaborative practices.

In practice, several governance models can be identified, commonly categorized into three forms: hierarchical (top-down), market-based (regulated through economic incentives), and network-based (collaborative) (Cruz-Paz et al., 2023). Each typology operates under a distinct logic in addressing public issues. Building on Kooiman's theoretical perspective, four key governance typologies can be further elaborated as follows:

a. Self-governance model – This model emphasizes the capacity of social entities to regulate themselves within broader social systems. Initially emerging spontaneously, such arrangements gradually become institutionalized as interest groups or stakeholder organizations. While not entirely independent, they can operate continuously in line with community preferences. However, the limitations of this model lie in its scope of participation and mobilization, as its effectiveness depends mainly on the community's capacity.
b. Hierarchical model – In this model, government authority plays a dominant role in directing subordinate units or community entities. Activities are driven by bureaucracy within the framework of specific policies. Nevertheless, this approach has been criticized for its highly centralized and top-down decision-making processes, which often render it less responsive to community needs.
c. Network or collaborative model – This model is characterized by the absence of a single dominant actor, instead emphasizing shared responsibility and cooperation. Interaction networks operate horizontally, enabling actors to address interdependencies, uncertainties, and resource needs jointly. At specific points, this model evolves into forms of *co-management*, where stakeholders are assigned specific roles to enhance legitimacy and compliance.
d. Market model – Here, governance is primarily shaped by market mechanisms, particularly through pricing, competition, services, and the distribution of incentives. Relationships among actors are defined by exchanges, with a tendency toward profit-seeking and economic gain. In this model, price mechanisms partially replace government functions. Moreover, the system is decentralized, encourages efficiency, and remains open to the participation of actors who reinforce economic incentives.

RESEARCH METHOD

This study employs a qualitative research design to provide an in-depth description of the forms of waste governance in Sleman Regency following the decentralization process. The decentralization that has been underway over the past year presents an initial opportunity to

identify key governance issues, organizational structures, emerging relationships, and the resources held by various stakeholders. A qualitative approach was chosen because it enables a contextual and interpretive understanding of social phenomena, particularly in exploring institutional practices and stakeholder interactions (Creswell & Creswell, 2014; Denzin & Lincoln, 2018). To capture these dynamics, semi-structured interviews were conducted in August and September 2025. The interviews involved key stakeholders, including officials from the Sleman Environmental Agency (Dinas Lingkungan Hidup/DLH), staff from the Integrated Waste Service Unit (UPT Persampahan), managers and employees of Integrated Waste Processing Sites (TPST), community-based 3R Waste Processing Sites, Village-Owned Enterprise (BUMDes)-run waste facilities, private waste facilities, and waste depots. Semi-structured interviews were selected to provide both flexibility and comparability across respondents, thereby enabling a more in-depth exploration of stakeholder perspectives (Kvale & Brinkmann, 2009).

In addition to interviews, direct field observations and facility surveys were carried out at TPSTs, community-based 3R facilities, BUMDes-run facilities, private facilities, and waste depots. These visits were intended to validate interview findings and to examine further how interactions among stakeholders unfold in practice, particularly regarding service processes, institutional arrangements, and policy frameworks. This process follows the logic of methodological triangulation, which enhances the credibility and robustness of qualitative findings (Patton, 2014; Yin, 2018).

FINDINGS AND DISCUSSION

The transformation of waste governance in Sleman following decentralization (Figure 1) is marked by at least two significant aspects. First, in terms of technical waste services, a significant change has occurred in the final disposal flow. Previously, all waste service providers—including local government units, community-based TPS3R, village TPS3R, private waste operators, and citizen-managed services—could directly dispose of waste at the Piyungan Landfill. Under the new system, all final waste discharge points have been relocated within Sleman Regency, with TPST Sleman, community-based TPS3R, and village TPS3R serving as the final waste disposal points. This shift places full responsibility for waste management within the administrative boundaries of Sleman.

Second, the governance change is reflected in a new orientation toward waste management, transitioning from the traditional landfill model to energy-based processing, specifically the production of RDF (*Refuse Derived Fuel*). This transition began with the construction of three new TPSTs in Sedangsari (Minggir), Donokerto, and Tamanmartani at the end of 2023. Additionally, the Sleman local government upgraded three existing depots—Kragilan, Lepongsari, and Panasan—into TPS3R facilities, capable of processing waste into RDF feedstock. All RDF material from these TPS3R facilities is then transferred to TPST Sedangsari, which currently serves as the final transit and processing site before the RDF is delivered to a cement industry located in Cilacap. These technical and operational transformations indicate a paradigm shift in Sleman's waste management system: from mere landfill disposal to a *waste-to-energy* model based on collaboration among the local government, community-level management units, and industrial end-users of RDF. The change also reflects efforts to strengthen the regency's autonomy in waste management while addressing the capacity limitations of the Piyungan Landfill, which had been the primary disposal site for nearly three decades.

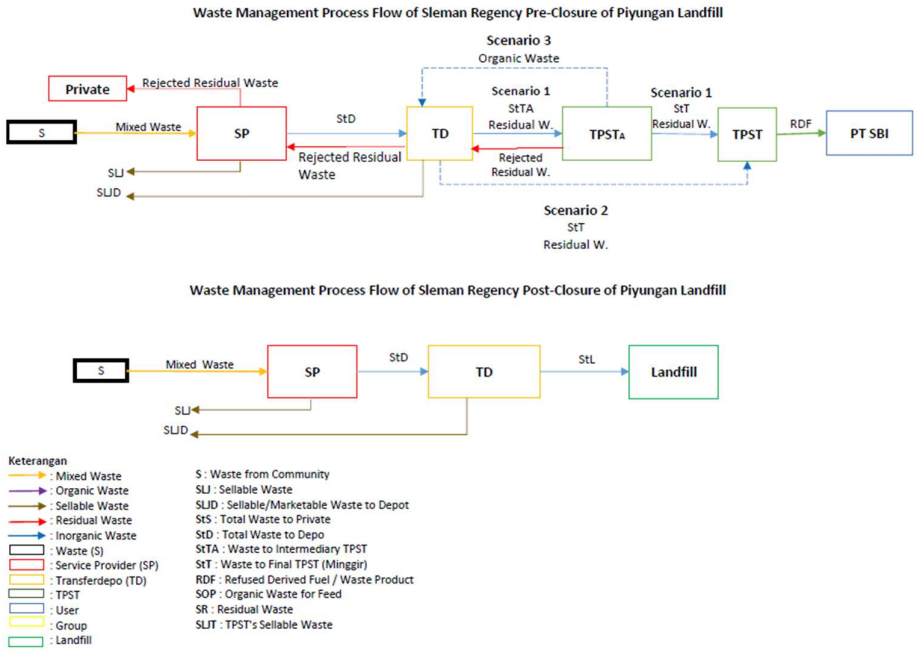

Figure 1. Comparative flow of waste management in Sleman Regency before and after the closure of the Piyungan Landfill, illustrating changes in collection, transfer, and processing pathways.

In the hierarchical mode, despite efforts by the Sleman Regency Government to strengthen governance through the Regent's Circular Letter on waste separation, institutional and governance practices face challenges, particularly due to operational complexity and readiness. At the time of the study, the processing capacity served was still around 24% of the waste processed from both formal and informal sectors, out of the estimated 600 tons/day of residential waste. Efforts to optimize depots and TPS 3R that have been undertaken face operational costs higher than the benefits obtained, which becomes a significant problem.

Furthermore, the process of calculating service coverage data is still limited to the number of households served, rather than the entire area. This makes it challenging to accurately map services in terms of waste potential and service needs. This situation is exacerbated by limitations in directly reaching household-level waste management, so most management is carried out through third parties, including both community and private actors. Only in commercial sectors such as hospitals, campuses, factories, or other parties with existing agreements does the Environmental Office (DLH) provide special collection services handled directly by its staff.

This gap has become a contested space among various actors in waste governance, including the community, the private sector, and village governments, as they strive to provide services to residents. In the self-governance mode in Sleman, it is represented by TPS 3R, managed by residents. Although most were initially formed due to government incentives, they then continue to manage themselves institutionally and organizationally to meet waste management needs at the village or neighborhood level. Both the local and central governments support the separation facilities and technology. In addition, they may receive assistance from other private entities or NGOs concerned with addressing the waste crisis.

However, this is not without conflicts of interest and differences in operational logic with the informal sector that existed before the decentralization of waste governance. This situation has

resulted in some practices that remain unstandardized, particularly in Community TPS 3R and Village TPS 3R. These TPS 3R are burdened with both sorting activities and managing the residues generated. With limited capacity and facilities, open burning or stove burning is more commonly practiced. As a result, a few of these actors send waste to the Sleman TPST.

Furthermore, most TPS 3R are not aligned with the RDF offtaker concept offered by the local government; they are more interested in seeking cooperation with other offtakers that are more economically profitable. Additionally, TPS 3R development is sometimes adapted to the specific context of each village, which may not align with the spirit of the local government as outlined in the RDF. On a more micro scale, there are waste bank entities. However, they have limited service coverage in terms of area and types of waste managed, as their focus is on sorting non-organic waste for sale to waste offtakers.

The market mode in Sleman's waste governance is evident in service provider institutions, particularly those operating outside the 3R framework. With limited direct services from the local government, actors entering households are service providers. Service delivery is conducted through direct agreements with consumers based on market mechanisms and incentives. There are no restrictions on service providers regarding geographic areas, and waste disposal can be directly delivered to TPST or the nearest government TPS 3R. Additionally, private entities offer disposal services by adopting smaller-scale "illegal" landfills. This, however, causes problems because some of the waste is burned independently without a standardized incinerator, and worse, some is left unmanaged.

The network/collaborative model is still limited in implementation within Sleman. There is no strong orchestration in coordinating the roles of stakeholders for horizontal waste management. Current local government efforts try to provide incentives for TPS 3R capable of delivering RDF to TPST Sendangsari, although the standards are still considered low. Other efforts include providing incentives for Community TPS 3R and Government TPS 3R to dispose of unmanaged residues for transportation to Piyungan. Stakeholder discussions so far have not been synchronized in developing a more collaborative co-management design.

CONCLUSIONS

Based on preliminary studies on waste governance models in Sleman following decentralization, four governance modes are currently in operation. However, these processes have not yet aligned with Kooiman's vision, which suggests that these modes would be efficient and effective if there were no imbalances or fragmentation. With services ending within Sleman, each actor faces pressure to devise solutions for the services they provide independently. As a result, what emerges is not synergy but rather "business as usual" activities. The current orientation remains strongly market-driven, making it difficult for the local government to intervene in household-level services. Furthermore, existing community entities lack standardized final sorting practices and the commitment to produce RDF for delivery to TPST Sendangsari. Strengthening waste governance in Sleman still requires orchestration of joint management practices and a policy framework oriented toward social engineering that involves all stakeholders.

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