

WASTE MANAGEMENT IN DECENTRALIZED INDONESIA: POLICY COHERENCE AND MULTI-LEVEL GOVERNANCE IN YOGYAKARTA

Teguh Yuwono*

*Associate Professor, Politics and Government Department, Faculty of Social and Political Sciences, Universitas Diponegoro, Indonesia. *Corresponding Author: teguhyuwono@lecturer.undip.ac.id*

Retna Hanani

Assistant Professor, Public Administration Department, Faculty of Social and Political Sciences, Universitas Diponegoro, Indonesia. Email: retnaharani@lecturer.undip.ac.id

Highlight

This paper examines policy coherence in multi-level governance and waste management in Yogyakarta. The case reveals policy and empirical impacts of waste management at the local level.

Abstract

In many developing nations, regulatory fragmentation across multiple government levels creates challenges, urban waste management in decentralized systems creates a difficult governance issue. This paper examines the consistency of waste management regulations in Yogyakarta, Indonesia, utilizing a policy coherence framework nested inside a multi-level governance (MLG) viewpoint. It analyses four main regulatory tools—Law No. 18/2008, Governor Regulation of Yogyakarta No. 16/2021, Yogyakarta City Regulation no. 9/2024, and Yogyakarta Mayor Regulation No. 57/2023—to evaluate vertical, horizontal, and internal policy alignment. Using qualitative content analysis, this paper shows that although the laws have no official legal conflict, operational goals, language, and institutional function definitions nonetheless differ. Lack of national mandates and subnational implementation plans causes vertical coherence to be compromised. City-level actors' horizontal cooperation among planning agency and environmental services agency is uneven, hence creating overlaps and inefficiencies. Moreover, internal consistency remains a problem; certain regulations have no obvious implementation or monitoring tools. Though acknowledged in normative frameworks, the study also emphasizes the underused function of community involvement and informal actors. This disparity reduces the impact of bottom-up integration inside the government structure. Based on the results, there is a need for regulatory harmonization, sectoral cooperation, and participatory procedures in improving policy consistency. This study provides recommendations for improving institutional alignment in urban waste management systems and adds to the larger conversation on environmental governance in decentralized settings.

Keywords

waste management, multi-level governance, policy coherence.

Introduction

In the Global South, urban waste management is a continuous and complex policy issue. Cities like Delhi, Manila, Lagos, and Jakarta have seen their municipal capacity strained and major governance holes exposed by rapid urbanization, increasing demand, and inadequate infrastructure [1] [2]. A common characteristic in these settings is the existence of fragmented regulatory systems whereby several levels of government run under overlapping responsibilities, varying goals, and little coordination. Particularly in decentralized administrative systems, this regulatory fragmentation hinders efficient execution and causes inefficiencies.

Indonesia shows these dynamics. Subnational governments have acquired considerable administrative and policy-making authority in service delivery, including waste management, after starting a process of political and administrative decentralization in the early 2000s. The separation of duties across national, provincial, and municipal governments, however, has not always been matched by efficient institutional systems guaranteeing policy consistency and operational coordination [3]. Cities, therefore, tend to create their regulatory tools that only somewhat fit national policies or regional plans, producing gaps in governance.

Extensive research has addressed environmental governance and decentralization in Indonesia [4][5][6][7][8]. Few, however, have used a methodical multi-level governance perspective to evaluate how horizontally and vertically regulating tools interact. Furthermore, little consideration has been paid to how informal and non-state players fit inside these structures. By providing a combined Multi-Level Governance study of regulatory governance in Yogyakarta's waste management policy, this report closes that gap.

The case of Yogyakarta offers an insightful example. Though a national legal system—Law No. 18/2008 on Waste Management, subnational regulations like Governor Regulation of Yogyakarta No. 16/2021, Regional Regulation of Yogyakarta City No. 9/2024, and Major Regulation No. 57/2023, show discrepancies in definitions, goals, and institutional roles. These differences reflect the problems with regulatory coordination seen in cities like Cairo, where national waste policy sometimes do not effectively trickle down to local governments [9], or Nairobi, where informal waste actors are badly integrated despite their critical importance [10]. Like in other developing urban areas, Yogyakarta's waste management system shows the conflict between decentralized autonomy and the demand for regulatory unity.

This paper uses the Multi-Level Governance (MLG) framework—which includes the dynamics of vertical authority (from national to local), horizontal cooperation (across agencies and sectors), and participatory governance (including non-state actors)—to examine this problem. MLG has been used in urban policy settings to clarify institutional misalignment and coordination problems in cities like Accra [11] and São Paulo [12], hence providing a helpful perspective to grasp regulatory consistency in distributed systems.

This article tackles the following issues. To what degree are waste management regulations in Yogyakarta consistent across several levels of government? How are government and non-government entities coordinated and involved within these regulatory frameworks? The study shows how discrepancies in policy goals, conceptual definitions, and actors' duties undermine regulatory efficacy. This study was conducted utilising qualitative content analysis of four laws ranging from national to municipal levels. The article adds theoretically and empirically to continuing discussions on how to control complicated environmental concerns in decentralized policy systems by placing Yogyakarta's instance within worldwide trends of urban environmental governance.

Material and Methods

Focusing on policy document analysis, this paper evaluates the degree of policy coherence in waste management governance in Yogyakarta using a qualitative-descriptive method. This approach was used to investigate how national, provincial, and city-level government laws interact and support shared objectives as well as to determine the degree of policy formulation-implementation alignment. Four key policy papers—Law No. 18 of 2008[13], Yogyakarta Governor Regulation No. 16 of 2021[14], Yogyakarta City Regional Regulation No. 9 of 2024[15], and Mayor Regulation No. 57 of 2023[16] are the main sources in this study.

The study was conducted using a policy coherence framework comprising three main dimensions: vertical coherence (alignment between levels of government), horizontal coherence (integration between sectors and actors at the same level), and internal coherence (consistency of objectives, instruments, and implementation in one regulation). Content analysis methods on the policy material—particularly in the goals, performance indicators, role division, and implementation and assessment systems—helped to examine each dimension. Furthermore, a relational matrix depending on the kind of relationship (top-down, horizontal, and bottom-up) was used to examine actor interactions to grasp the coordination and participation structure controlled in the regulation.

This study also uses the concept of source triangulation to ensure validity by contrasting the material of regulations with institutional practices recorded in regional planning papers like *Rencana Kerja Pemerintah Daerah* (Regional Development Workplan) and agency performance reports. This method is useful to evaluate not only the normative consistency between laws but also the correctness of implementation and responsiveness of policies to local dynamics. Therefore, this paper presents a thorough evaluation of how Yogyakarta's waste management governance is created in an integrated way using a multi-level governance strategy.

Conceptual Framework

Decentralization has been frequently advocated as a way to increase local service delivery, promote responsibility, and boost democratic involvement during the last three decades [17] [18]. Decentralization in the environmental sector, especially in solid waste management, requires local governments to customize solutions

to fit particular circumstances. Many developing nations, however, have seen fragmented government systems created by the process with ambiguous mandates and uneven policy execution across administrative levels [19]. Cities like Jakarta, Nairobi, and Lima regularly show that although power has been devolved, capacity and regulatory consistency have fallen behind [1][2]. Decentralization in Indonesia since 2001 has significantly changed the governance scene in Indonesia, giving provinces and cities great power in public service delivery. But this arrangement creates more problem to complex sectors like waste management. Overlapping authorities between national and subnational players have hindered policy execution [3].

Policy Coherence

A key idea in public policy research, policy coherence stresses the need of consistency, synergy, and alignment among several policies across sectors and levels of government. Policy coherence is seen in the framework of complex policy governance as a deliberate attempt to guarantee that policies implemented by different government entities are complementary and do not conflict in pursuing shared development objectives. According to Nilsson et al., policy coherence is "the systematic promotion of mutually reinforcing policy actions across government departments and agencies to create synergy in achieving mutually agreed goals." Coherence in this context not only reflects the ability for efficient governance but also a normative desire [20].

Understanding policy coherence has three primary aspects: internal, horizontal, and vertical. Internal coherence is the uniformity of policies inside a sector or level of government; for example, how waste management regulation at the city level is coordinated in principle and execution among units under the environmental service. Horizontal coherence is the coordination and uniformity across several sectors at the same level of government, such as between the environmental, health, and tourism sectors all impacted by waste management laws. On the other hand, vertical coherence is the alignment between national, provincial, and district/city levels of government in policy development and execution.

Policy coherence is crucial in multi-level governance (MLG) systems since a network of actors across institutions and levels of government, not merely one, designs and executes policies. Often, the absence of consistency results in program duplication, waste of resources, and uncertainty in policy execution. Sometimes, disorganization can actually erode public confidence in the government. According to Cejudo and Michel, policy consistency is not merely a matter of official coordination systems; institutional capacity, information exchange systems, and cross-sector and cross-level leadership also significantly influence it [21].

Institutional fragmentation, variations in government-level power (particularly in relation to decentralization), and lack of a strong coordinating forum are among key obstacles to policy consistency. Furthermore, significant barriers to attaining policy consistency include political and bureaucratic processes that favour sectoral interests or particular players. Given the intricacy of the asymmetric decentralization system and the various institutional capacities in the areas, this is rather pertinent in the Indonesian setting. In waste management, for instance, a national legal framework like Law No. 18 of 2008 exists, but provincial and municipal policies frequently vary in program emphasis, performance criteria, and even language, therefore compromising their field implementation efficacy. Therefore, in policy governance, policy coherence is not just a normative goal but also a major sign of effective cooperation among actors inside a multilevel governing system. Poor policy coherence runs the risk of fragmenting public policy, rendering it inefficient and far from sustainable development objectives.

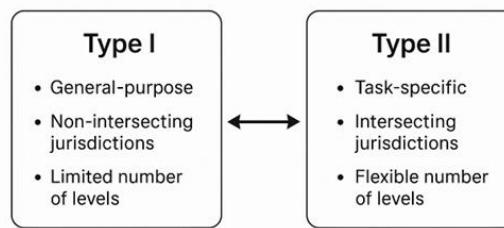
Policy Coherence in Multi-level Governance

This paper highlights policy coherence in a Multi-Level Governance (MLG) setting. The study thus examines the extent of coordination, consistency, and integration among waste management regulations across different government tiers in Yogyakarta. Originating from research on European integration, the idea of MLG has developed into a commonly used theoretical tool in governance research. According to Liesbet Hooghe and Gary Marks, MLG is the spread of decision-making power over several territorial levels and institutional players, both governmental and non-governmental. It understands that a dynamic interaction among people working inside and across jurisdictions shapes policy-making; therefore, policy-making is no longer the sole realm of central government [22].

MLG differentiates between two categories of governance structures: Type I, which reflects stable, general-purpose jurisdictions like national-provincial-local hierarchies, and Type II, which captures flexible, issue-specific networks including public, corporate, and civil society actors. Regarding waste management, both kinds are

concurrently pertinent: formal regulatory hierarchies define obligations across administrative levels, while implementation more and more depends on multi-actor cooperation and community involvement.

Figure 1. Multi-Level Governance Framework



Source: Hooghe & Marks (2003)

Using the MLG perspective on the Yogyakarta case, this paper emphasizes three key aspects of regulatory coordination:

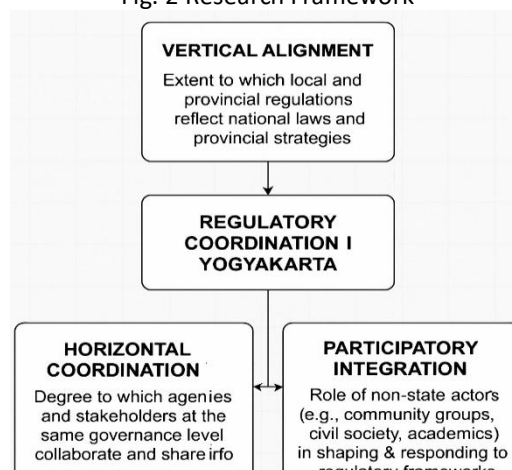
Vertical Alignment: The degree to which municipal and provincial laws (e.g., Yogyakarta City Regulation No. 9/2024, Perwali No. 57/2023) reflect, operationalize, and align with national laws (UU No. 18/2008) and provincial strategies (Yogyakarta Gubernatorial Regulation No. 16/2021). Target-setting, vocabulary, and programmatic emphasis misalignment—despite no legal contradiction—may indicate institutional disconnects that impede execution.

Horizontal Alignment: The extent to which agencies and stakeholders at the same governance level—e.g., *Dinas Lingkungan Hidup* (City Environmental Office), *Badan Perencanaan Pembangunan Daerah* (Regional Planning Agency), community organizations, and the business sector—cooperate, share information, and standardize procedures. MLG underlines here the need for cross-sectoral and cross-agency synergy in guaranteeing integrated waste management services. The influence and response to regulatory frameworks by non-state actors—informal waste workers (scavengers), civil society organizations, educational institutions, and local communities—shapes horizontal alignment. From the MLG point of view, these actors are not just implementers but rather co-producers of policy results whose participation is necessary for adaptive and responsive government.

Research Framework

The article investigates the efficacy of present regulatory systems in enabling consistent and coordinated waste governance by means of this theoretical perspective. Though the legal structure shows no clear conflict, the paper contends that vertical harmonization, operational coordination, and the real institutionalization of bottom-up participation present major problems. MLG, therefore, offers a diagnostic as well as a normative tool for evaluating and enhancing policy consistency in distributed environmental management. The framework is shown in fig. 2 below:

Fig. 2 Research Framework



Source: Authors

Findings and Discussion

This paper examines the dynamics of waste management regulations in the city of Yogyakarta using the Multilevel Governance (MLG) theoretical framework together with the policy coherence technique. The MLG method helps to clarify how the process of policy creation, execution, and coordination is no longer monopolized by a single actor at the central level but rather dispersed across several levels of government and engaging several non-state entities. Policy coherence is used to evaluate the consistency and alignment of policies among these actors—vertically (between levels of government), horizontally (across sectors), and internally (inside a specific organization or sector).

Vertical coherence is measured in waste management by the relationship between regulations at various levels — national level Law No. 18/2008, provincial level Yogyakarta Governor Regulation No. 16/2021, to Regional Regulations and Mayoral Regulations at the city level. Lack of consistency in terms of language, waste reduction goals, and division of institutional responsibilities reveals the possibility of policy fragmentation, which finally compromises the efficacy of implementation at the local level. There will be discrepancies in the design of the waste collection, transportation, and final processing programs, for instance, if the Mayoral Regulation employs a home waste categorization different from that in the Regional Regulation or Governor Regulation.

Furthermore, when stressing the relationship between different institutions at the municipal level —such as the Environmental Agency (DLH), Bappeda, Health Agency, and non-governmental partners, including scavenger communities, NGOs, and the corporate sector—horizontal coherence becomes extremely important. Lack of cross-sector cooperation could lead to program duplication or perhaps institutional conflict under mandates. Many community-based waste management projects, in reality, lack finance or policy backing since they are not included in other sectoral development strategies.

Internal consistency, on the other hand, helps chart policy consistency inside an organization or sector. The consistency between strategic planning papers (Renstra), technical implementing regulations, and assessment tools in the DLH environment, for instance, is a sign of whether the policies carried out are really targeted and results-based. Poor internal consistency frequently leads to reporting discrepancies, inadequate performance measures, and stifled public sector innovation.

This theoretical framework's integration of MLG and policy consistency lets scholars not only identify who actors are engaged but also how the quality of relationships, coordination, and alignment between actors and between policies is created or impeded. Therefore, this paper not only points out people and their responsibilities in waste management but also examines how the design of local policies and laws reflects the degree of harmony affecting the performance of cooperative governance. In the context of decentralization in Indonesia, where the complexity of the distribution of authority and differences in competence between areas call for greater coordination and policy harmonizing tools, this study is significant.

Table 1. Summary of Waste Management Regulations

Regulation Name	Level	Main Settings	Objective	Important Component
Law Number 18 of 2008	National	Sustainable and environmentally friendly waste management from upstream to downstream	Improving public health, environmental quality, and turning waste into a resource	Determining the authority of the central and regional governments, including the principles of management, types of waste, and the duties of each party.
Governor Regulation of the Special Region of Yogyakarta No. 16 of 2021	Province (Yogyakarta)	Changes in policies and strategies for managing household waste and the like	Optimization of waste reduction and handling targets in Yogyakarta Province	Targeting a reduction of up to 30% and handling of up to 70% of waste by 2025
Yogyakarta City Regional Regulation No. 9 of 2024	City	Amendment to Regional Regulation No. 10 of 2012 concerning waste management	Strengthening integrated management, cooperation and partnership in waste management	New definitions of terms such as TPS 3R, TPST, compensation, incentives-disincentives, and self-management
Yogyakarta Mayor Regulation No. 57 of 2023	City	Changes to the 2023 Regional Development Workplan (<i>RKPD</i>) of the City of Yogyakarta	Adjusting assumptions, programs and regional finances according to actual developments	Load adjustments to development performance indicators including environmental and waste management fields

Source: Authors

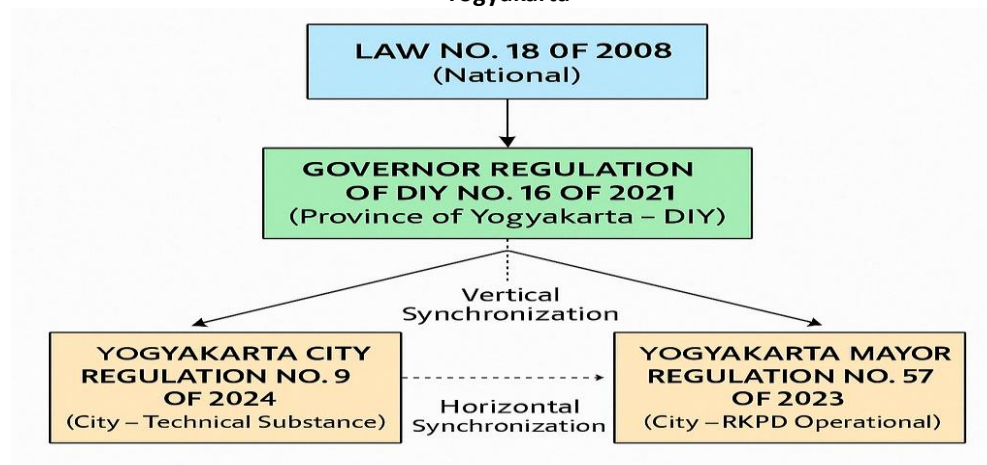
The table of waste management regulations in Yogyakarta reveals incremental attempts to harmonize national to local policy. Yet, seen from the perspective of policy consistency, there are still significant difficulties guaranteeing integration between these regulations. Law Number 18 of 2008 functions as a national framework that sets fundamental principles of sustainable waste management, government duties, and role division in the context of vertical coherence reflecting the degree of alignment and operation of local and provincial policies with national policies. All derivative policies use this statute as a normative and institutional point of reference.

The law was then implemented in the Governor of the Special Region of Yogyakarta Regulation No. 16 of 2021 and the Yogyakarta City Regulation No. 9 of 2024, which reflect specific efforts to translate the law by defining quantitative goals (for example, 30% reduction, 70% handling by 2025) and the redefinition of institutional ideas such *Tempat Pengolahan Sampah dengan Prinsip 3R* (Waste Processing Place with the principles of Reduce, Reuse, and Recycle) and *Tempat Pengolahan Sampah Terpadu* (Integrated Waste Processing Facility). Though there is no clear direct conflict, vertical coherence is not yet completely optimal since not all principles or indicators of Law 18/2008 are explicitly stated in the regulations below it, including the principle of a circular economy or the participation of informal communities like scavengers.

From the horizontal coherence that considers the integration between sectors and actors at the same level, the Yogyakarta Mayor Regulation No. 57 of 2023 can be seen to alter the Regional Development Workplan by changing development performance indicators, including waste management, which reflects sectoral changes in planning and budgeting. This consistency guarantees that environmental policy, development planning, and budgets complement one another. But, issues could rise if the allocation of funds for incentives/disincentives is not in line with the technical targets stated by the Regional Regulation or Governor Regulation.

Reviewed from the internal coherence to evaluate consistency in one regulation, including the integration of goals, policy instruments, and their execution, Yogyakarta City Regulation No. 9 of 2024 enhances internal coherence by means of definitions and institutions, including the inclusion of incentives and disincentives and promotion of autonomous management. This indicates a desire to create a more thorough and responsive policy to field dynamics. Including operational tools or monitoring systems to assess the accomplishment of somewhat ambitious goals—30% reduction, 70% handling—would help to strengthen the internal consistency of Yogyakarta Governor Regulation No. 16/2021. The following graphic briefly depicts the vertical and horizontal relationships of waste management regulations in Yogyakarta.

Fig. 3 Map of Vertical and Horizontal Synchronization Between Waste Management Regulations in Yogyakarta



Source: Authors

This study reveals that although the regulatory system for waste management in Yogyakarta typically tries to exhibit cross-level policy consistency, it nevertheless struggles with indicator synchronization, funding, and converting normative values into technical actions.

Analysis of Policy Coherence of Waste Management Regulations in Yogyakarta

From national laws to city-level ordinances, waste management is a strategic concern governed at several levels of government. This paper offers an analysis of regulatory alignment among Law Number 18 of 2008, Yogyakarta Governor Regulation Number 16 of 2021, Yogyakarta City Regional Regulation Number 9 of 2024, and Yogyakarta Mayor Regulation Number 57 of 2023 in the framework of household waste management and related household waste.

This study aims to determine the appropriateness of material, policy direction, and possible conflicts between relevant laws so helping efficient and integrated program execution and policy-making.

Table 2. Regulatory Alignment Analysis in Waste Management Regulation

Aspect/Substance	Law No. 18/2008	Yogyakarta Governor Regulation No. 16/2021	City Regulation No. 9/2024	Mayoral Regulation No. 57/2023
Definition and classification of waste	Complete and detailed	Not explicitly stated	Very detailed and expanded	Not discussed
Principles and principles of management	Justice-based and sustainable	Technically aligned	Referring to the Law	Not explained
Waste reduction targets	Not setting a target number	Quantitative target 30% reduction	Not mentioning numbers, supporting cooperation	No mention of target
Institutions and division of roles	Explaining the role of central and regional governments	Establishing provincial strategy	Emphasizing partnerships and waste management	Determining the direction of Regional Development Workplan (RKPD), not yet focused on waste
Funding and incentives	Mentioning compensation and incentives	Not explicitly mentioned	Calling incentives-disincentives	Not discussed

Source: Authors

According to the table above, no normative conflict between regulations was discovered; nevertheless, there was a lack of synchronization in terms of goals, technical language, and operational policy emphasis. Regulations must thus be harmonized and cross-sector collaboration as well as central, provincial, and municipal governments strengthened by concerted efforts.

Reviewing the four laws' material—Law No. 18 of 2008, Yogyakarta Governor Regulation No. 16 of 2021, Yogyakarta City Regulation No. 9 of 2024, and Yogyakarta Mayor Regulation No. 57—reveals several possible disharmonies or coordination gaps as follows:

1. Inconsistency of goals and practical implementation

Emphasizing a system from upstream to downstream, Law No. 18 of 2008 declares that the concept of waste management is a shared obligation. By 2025, Yogyakarta Governor Regulation No. 16 of 2021 aims to cut household waste by 30%. Though as an administrative unit under the province, the City of Yogyakarta should mention and align the target in its policies and budget, the Yogyakarta City Regulation and Mayor Regulation have not specifically mentioned the direct connection or modification to the provincial target. If the province's goals and strategies are not methodically described in district/city policies, possible coordination conflicts could result.

2. Focus on Management Strategy

Strongly stressing multi-party cooperation, incentives/disincentives, and emergency response systems, Law 18/2008 and Regional Regulation No. 9/2024 Mayoral Regulation No. 57/2023, on the other hand, lack clear waste management prioritization despite their development goals and environmental assessments, thereby creating a discrepancy between strategic direction and budget execution. This reveals a conflict in priority between annual operations (Regional Development Workplan Evaluation Team) and strategic regulations.

3. Variations in Definition and Vocabulary

Definitions like "self-management", "compensation", "TPS 3R", and "TPST" are governed by Law 18/2008 and Regional Regulation 9/2024. Though they are crucial in promoting waste reduction at the community level, the Governor's Regulation does not explicitly address the type of self-management or incentive/disincentive programs. Not all terms and cross-level policy tools are in line, so this could lead to discrepancies in execution.

Actors based on regulations

The different regulations controlling waste management also reveal the key players openly or implicitly referenced in waste management. Each law defines the following participants involved. National Law Number 18 of 2008 is the highest legal umbrella defining the principles, kinds of waste, and the responsibilities and authorities of actors as a whole. The actors involved are the Central Government (Minister of Environment and Forestry, President), Provincial/District/City Governments (Governor, Regent, Mayor, Technical Service Offices), Society (Households, communities, scavengers, informal groups), Business/Private Sector (Goods producers, waste management companies, recycling industries), Research and Education Institutions (For the development of management technology), and Cross-Sector Coordinating Institutions (For the harmonization of regulations and operationalization of policies across Ministries/Institutions).

Second, Yogyakarta Province Governor Regulation No. 16 of 2021. This gubernatorial rule verifies the provincial level waste reduction/handling strategy and goal. The actors involved are the Governor and Regional Apparatus of the Special Region of Yogyakarta (Special Region of Yogyakarta Environmental Service, Public Works and Energy and Mineral Resources Service, Development Planning Agency), Regency/City Governments throughout the Special Region of Yogyakarta (As technical implementers in the area), Business Actors (Who produce and manage waste), the Special Region of Yogyakarta Community (As producers and agents of behavioral change). Mass media (as a support of public campaigns and education), non-governmental organizations (NGOs), environmental communities (supporting education and advocacy), and non-governmental organizations (NGOs).

Regional Regulation No. 9 of 2024 Yogyakarta City. This rule offers an operational description of waste management in the city including independent and collaborative management. The Mayor and Regional Apparatus (Environmental Office, Sub-district Head, Village Head), Waste Managers (TPST, TPS3R, third parties through contracts/partnerships), Community (As producers and independent managers), Business Actors (Restaurant owners, hotels, markets, shopping centers), Educational and Social Institutions (For promotion of awareness and community-based management), Informal groups (Scavengers, waste collectors, recycling MSMEs), and the Regional People's Representative Council (DPRD) (Supervision and legislation) are the participants involved.

Regulation No. 57 of 2023 for Yogyakarta Mayor concentrates on changing the Regional Development Workplan Evaluation Team (annual planning); not just on waste but also on cross-sector development assessment. The actors participating include the Mayor of Yogyakarta, All Regional Apparatus (particularly Bappeda and DLH), Yogyakarta City DPRD, Community (in the context of Development Planning Forum), Regional Development Workplan Evaluation Team, Development Stakeholders (Cross-sector such as health, education, environment).

Table 3. Actors Involvement Based on The Existing Regulations

Actor Category	Name of Relevant Actor/Institution
Central government	Ministry of Environment and Forestry, President of the Republic of Indonesia
Provincial government	Governor of Yogyakarta, Yogyakarta Environmental Office, Yogyakarta Development Planning Agency (Bappeda)
City government	Mayor of Yogyakarta, City Environmental Agency, Sub-district Head, Village Head
Regional People's Representative Council (DPRD)	DPRD of Yogyakarta City, DPRD of Yogyakarta Province
Business Sector	Manufacturers of goods, service and industrial business actors, waste managers
Public	Households, local communities, self-help groups
Waste Management	TPS 3R, TPST, third party operators
Educational institutions	Schools, universities, research centers
Informal Group	Scavengers, collectors, recycling SMEs
NGO & Media	Civil society organizations, local media

Source: Authors

The form of relations between actors in waste management indicates a combination of top-down relationship, horizontal, and bottom-up relations.

First: Hierarchical Relationship: Top-Down

Particularly in the official regulatory structure of Law No. 18 of 2008 is then translated to Governor Regulation to Regional Regulation and eventually Mayor Regulation; this relationship is quite evident. National policies provide

the foundation for policy direction at the provincial and city levels in this hierarchical order in the Indonesian legal system. The central government establishes national standards and policies; the central government, the provincial government, city government. The local administration runs them operationally; governors and regional apparatus convert them into regional goals and programs. The waste reduction goal in the Yogyakarta Gubernatorial Regulation, coming from Presidential Regulation 97/2017, which is required in Law 18/2008, and technically addressed by the Regional Regulation and Mayoral Regulation, shows this.

Two: Horizontal (Coordinative) Relationships

Actors at the same level, for example: the Environmental Agency, Bappeda, Sub-district Heads, Village Heads cooperate horizontally at the city level. Often interacting directly as partners or equals to the local government, NGOs, media, business sector, and communities. Provincially, the Yogyakarta Environmental Provincial Office, PUP-ESDM (Department of Public Works, Housing, and Mineral Resources Energy at Provincial Level), Yogyakarta Provincial Planning and Development Office, have to also coordinate actions without commanding one another. Program planning, public awareness, and management partnerships like TPS3R or TPST all benefit from this relationship.

Three: Bottom-Up (Participative) Relationship

Normatively and practically, this interaction takes place in the framework of Development Planning Forum, the foundation of Regional Development Workplan Evaluation Team (as per Mayor Regulation No. 57/2023). The City Regulation and Law No. 18/2008 acknowledge community projects, independent waste management, the function of scavengers and MSMEs as components of the management system. Changes to regional policies or plans are frequently influenced by pressure or input from the mainstream media and the community. This shows a cooperative government strategy rather than merely administrative control.

Table 4. Regulatory Hierarchy-Based Actor Relations in Waste Management in Yogyakarta

Relation	Government Relation	Dominant Role	Supporting Regulations
Top Down	Central Government to Regions	Policy director	Law 18/2008, Yogyakarta Governor Regulation
Horizontal	Environmental Service ↔ Bappeda ↔ Business Sector	Equal coordination	City Regulation, Governor Regulation
Bottom Up	Community → Development Planning Forum, TPS 3R	Public participation	Mayoral Regulation, Law 18/2008

Source: Authors

From studies of these players, it is clear that the top-down relationship shows vertical coherence, specifically the alignment of policy direction from the centre to the areas. The national normative system for waste management is set under Law No. 18 of 2008. The central government's predominant responsibility is as a policy director, which is then reflected by the Yogyakarta Governor Regulation. Although this vertical coherence is really strong, it relies on how far the centre's guidance is carried out by the areas, including in quantitative goals and financial assistance.

The link among actors also reveals horizontal relations denoting equal cooperation across technical authorities (DLH), planners (Bappeda), and the business sector. This indicates that the economic and development sectors, as well as the environmental agency, bear responsibilities for waste management. This horizontal coherence suggests that the effectiveness of the policy relies on the synergy between equal players, and regulations such as City regulations and Governor Regulations serve as a foundation for technical and strategic cooperation. But coordination does not necessarily ensure integration. Policies between sectors are frequently fragmented; for example, performance metrics or budgets lack synchronization.

Conversely, there is a bottom-up relationship reflecting the aspect of participatory coherence, whereby policies allow the community to express their needs and play an active role, for example, via the *Musyawarah Perencanaan Pembangunan Forum* (Development Planning Forum) and the management of TPS3R. While laws like the Mayoral Regulation and Law 18/2008 do create room for participation, this involvement has to be more than symbolic; it should be beneficial in planning and supervision. This consistency calls for enhancing the capacity of local institutions so that people's desires affect strategic choices rather than merely guide them during the input process.

The multi-level governance (MLG) emphasizes how policy-making, execution, and coordination have turned shared duties no longer under central authority. Rather, these procedures include different degrees of government and a wide range of non-state entities. In this regard, the idea of policy coherence enables us to

assess how well these players align their rules and actions—vertically (across levels of government), horizontally (among actors at the same level), and internally (inside institutions themselves)[23]. From a vertical viewpoint, this study indicates that although there is no clear legal conflict among the national Law No. 18/2008, the Governor Regulation of Yogyakarta No. 16/2021, and Yogyakarta's municipal trash restrictions, their approaches do not exactly correspond. The Governor's rule, for instance, specifies unambiguous objectives of 0% waste reduction and 70% management by 2025 but the city's rules do not immediately reflect these goals. This disparity produces a lack of common direction and strategy. Similar discrepancies have been noted in other decentralized environments, such as Manila [24] and Accra [25], where local projects frequently fall short of fulfilling national environmental objectives. From a horizontal perspective, cooperation across city-level agencies including the Environmental Agency (DLH), Bappeda, health offices, and informal groups like rubbish pickers and NGOs stays inconsistent. Their activity runs the danger of being fragmented and less effective without common performance indicators or a joint financing system. By contrast, Surabaya presents a good example—its unified composting and trash reduction initiative demonstrates what is feasible when agencies cooperate efficiently under unambiguous orders and data-sharing systems. Internally, consistency inside each institution is still a work in progress. Yogyakarta's Regulation No. 9/2024 offers encouraging changes such improved policy definitions and incentives. Its lack of detail, particularly in defining measurable goals or tracking mechanisms, is not sufficient. This is not particular to Yogyakarta; cities like Accra and São Paulo also battle fragmented planning tools and inadequate internal assessment methods that hinder execution.

More importantly, this study emphasizes the sometimes-neglected significance of bottom-up involvement in trash management. Although the city offers ways for public participation via initiatives like TPS3R and Development Planning Forum—these are usually symbolic unless backed by official feedback systems and committed resources. International experience from India and Kenya shows that community-driven garbage management works best when reinforced by institutional support, not merely rhetorical recognition. In sum, integrating the perspectives of MLG and policy consistency helps to better understand not only "who does what" but also how relational and structural dynamics influence policy results. Given Indonesia's uneven decentralization, where local capacities vary greatly, this study emphasizes the critical need for improved institutional alignment, more inter-agency cooperation, and real community involvement. Building a good and sustainable municipal waste management system depends on these components.

Conclusion

The results of this study indicate that the Yogyakarta waste management system has developed under a regulatory framework toward a governance model including several players at the national, provincial, and municipal levels. This paper emphasizes the need for vertical alignment, horizontal coordination, and participatory integration in creating and executing efficient waste management policies by means of a policy coherence method inside a multi-level governance (MLG) system.

Generally, laws like Law No. 18/2008, Yogyakarta Governor Regulation No. 16/2021, City Regulation No. 9/2024, and Mayor Regulation No. 57/2023 do not clash. In-depth study reveals, therefore, that significant areas still lack synchronization, including technical definitions, institutional job division, and waste reduction goal formulation. Especially at the city level, this vertical disparity indicates that the national legal framework has not been completely translated operationally into subnational policies. This could lead to ambiguous direction of execution and low program responsibility.

From the horizontal side, coordination between sectors and agencies at the city level has not been fully integrated, which is reflected in the various approaches between planning documents (such as Regional Development Workplan Evaluation Team) and environmental technical regulations. Several policy tools have included community involvement; yet, it remains normative and needs institutional fortification to really influence choices. Improving policy coherence depends therefore on efforts to harmonize cross-level regulations, cross-sector integration, and enhance participatory mechanisms. This result verifies that not only regional autonomy but also the degree of coordination among actors under a cooperative and sustainable governance system determines the success of waste management in a decentralized system.

This study emphasizes on legal framework which may limit the discussion. Although content analysis offers a thorough analysis of formal structures, it does not completely reflect the informal dynamics or power relationships affecting the implementation of the regulations. execution. Future studies should include performance measures, anthropological observation, and stakeholder interviews to evaluate how governance

deficiencies appear in practice. Comparative research among Indonesian cities or with other Southeast Asian nations would also help to clarify our knowledge of whether institutional arrangements, coordination tools, or community practices provide more robust waste management systems in decentralized settings.

Author Contributions

TY: Writing drafts, designing concepts, collecting data, conducting analysis. RH: data collection and analysis

Conflict of Interest

The authors declare no conflict of interest

Reference

- [1] A. Scheinberg, "Solid Waste Management in the World's Cities, UN-HABITAT Ljiljana Rodic-Wiersma European Commission," 2010.
- [2] D. C. Wilson, C. Velis, and C. Cheeseman, "Role of informal sector recycling in waste management in developing countries," *Habitat Int.*, vol. 30, no. 4, pp. 797–808, 2006, doi: 10.1016/j.habitatint.2005.09.005.
- [3] D. Hudalah, T. Firman, and J. Woltjer, "Cultural Cooperation, Institution Building and Metropolitan Governance in Decentralizing Indonesia," *Int. J. Urban Reg. Res.*, vol. 38, no. 6, pp. 2217–2234, 2014, doi: 10.1111/1468-2427.12096.
- [4] T. Firman, "Decentralization reform and local-government proliferation in indonesia: Towards a fragmentation of regional development," *Rev. Urban Reg. Dev. Stud.*, vol. 21, no. 2–3, pp. 143–157, 2009, doi: 10.1111/j.1467-940X.2010.00165.x.
- [5] J.-J. Dethier, "Trash, Cities, and Politics: Urban Environmental Problems in Indonesia," *Indonesia*, vol. 103, no. 103, pp. 73–90, 2017.
- [6] L. A. H. Purba and A. Erliyana, "Legal Framework of Waste Management in Indonesia," vol. 413, no. Icolgis 2019, pp. 104–108, 2020, doi: 10.2991/assehr.k.200306.191.
- [7] A. N. Rahmasary, S. H. A. Koop, and C. J. van Leeuwen, "Assessing Bandung's Governance Challenges of Water, Waste, and Climate Change: Lessons From Urban Indonesia," *Integr. Environ. Assess. Manag.*, vol. 17, no. 2, pp. 434–444, 2021, doi: 10.1002/ieam.4334.
- [8] R. D. Al Fariz, R. Muis, N. Anggraini, I. Rachman, and T. Matsumoto, "Good Environmental Governance Roles in Sustainable Solid Waste Management in Indonesia: A Review," *J. Community Based Environ. Eng. Manag.*, vol. 8, no. 8, pp. 45–56, 2024, doi: 10.23969/jcbeem.v8i1.12035.
- [9] M. Salem, "Landscape fragmentation in peri-urban Greater Cairo as a result of uncontrolled urban sprawl," 2024, pp. 191–214.
- [10] R. Linzner and U. Lange, "Role and size of informal sector in waste management – a review," *Proc. Inst. Civ. Eng. - Waste Resour. Manag.*, vol. 166, no. 2, pp. 69–83, May 2013, doi: 10.1680/warm.12.00012.
- [11] C. Amoako and E. Frimpong Boamah, "The three-dimensional causes of flooding in Accra, Ghana," *Int. J. Urban Sustain. Dev.*, vol. 7, no. 1, pp. 109–129, Jan. 2015, doi: 10.1080/19463138.2014.984720.
- [12] R. Bichir, G. H. Brettas, and P. Canato, "Multi-level governance in federal contexts: the Social Assistance Policy in the City of São Paulo," *Brazilian Polit. Sci. Rev.*, vol. 11, no. 2, Jul. 2017, doi: 10.1590/1981-3821201700020003.
- [13] Indonesia, *Undang-undang (UU) Nomor 18 Tahun 2008 tentang Pengelolaan Sampah (Law Number 18 of 2008 concerning Waste Management)*. LN.2008/NO.69, TLN NO. 4851, LL SETNEG : 25 HLM, 2008.
- [14] Provinsi Daerah Istimewa Yogyakarta, *Peraturan Gubernur (Pergub) Provinsi Daerah Istimewa Yogyakarta Nomor 16 Tahun 2021 tentang Perubahan Atas Pergub Yogyakarta No.123 Tahun 2018 ttg Kebijakan dan Strategi Yogyakarta dalam Pengelolaan Sampah Rumah Tangga dan Sampah Sejenis Sampah Rumah Tangga (Governor Regulation Number 16 of 2021 concerning Amendments to the Yogyakarta Governor Regulation No. 123 of 2018 concerning Provincial Policies and Strategies in Managing Household Waste and Waste Similar to Household Waste)*. BD.2021/NO.16, 2024.
- [15] Kota Yogyakarta, *Peraturan Daerah (Perda) Kota Yogyakarta Nomor 9 Tahun 2024 tentang Perubahan Kedua atas Peraturan Daerah Kota Yogyakarta Nomor 10 Tahun 2012 tentang Pengelolaan Sampah (Yogyakarta City Regulation Number 9 of 2024 concerning the Second Amendment to Yogyakarta City Regulation Number 10 of 2012 on Waste Management)*. LD. 2024/NO.9, 2024.
- [16] Kota Yogyakarta, *Peraturan Walikota (Perwali) Kota Yogyakarta Nomor 57 Tahun 2023 tentang Perubahan Rencana Kerja Pemerintah Daerah Tahun 2023 (Yogyakarta Mayor Regulation Number 57 of 2023 concerning Amendments to the 2023 Regional Government Work Plan)*. BD.2023/NO.57, 2023.
- [17] J. C. Ribot, "African Decentralization: Local Actors, Powers and Accountability," *Int. Dev. Res. Cent.*, p.

- 103, 2002.
- [18] P. Smoke, "Decentralisation in Africa: goals, dimensions, myths and challenges," *Public Adm. Dev.*, vol. 23, no. 1, pp. 7–16, Feb. 2003, doi: 10.1002/pad.255.
- [19] J. A. Puppim de Oliveira, "The implementation of climate change related policies at the subnational level: An analysis of three countries," *Habitat Int.*, vol. 33, no. 3, pp. 253–259, Jul. 2009, doi: 10.1016/j.habitatint.2008.10.006.
- [20] M. Nilsson *et al.*, "Mapping interactions between the sustainable development goals: lessons learned and ways forward," *Sustain. Sci.*, vol. 13, no. 6, pp. 1489–1503, Nov. 2018, doi: 10.1007/s11625-018-0604-z.
- [21] G. M. Cejudo and C. L. Michel, "Addressing fragmented government action: coordination, coherence, and integration," *Policy Sci.*, vol. 50, no. 4, pp. 745–767, Dec. 2017, doi: 10.1007/s11077-017-9281-5.
- [22] H. Liesbet and M. Gary, "Unraveling the Central State, but How? Types of Multi-level Governance," *Am. Polit. Sci. Rev.*, vol. 97, no. 02, May 2003, doi: 10.1017/S0003055403000649.
- [23] J. Torfing, B. G. Peters, J. Pierre, and E. Sørensen, "Interactive Governance: Advancing the Paradigm," *Interactive Governance: Advancing the Paradigm*. pp. 1–288, 2012, doi: 10.1093/acprof:oso/9780199596751.001.0001.
- [24] E. Porio, "Vulnerability, Adaptation, and Resilience to Floods and Climate Change-Related Risks among Marginal, Riverine Communities in Metro Manila," *Asian J. Soc. Sci.*, vol. 39, no. 4, pp. 1–23, 2011.
- [25] P. A. Williams *et al.*, "Review of Barriers to Effective Implementation of Waste and Energy Management Policies in Ghana: Implications for the Promotion of Waste-to-Energy Technologies," *Waste*, vol. 1, no. 2, pp. 313–332, 2023, doi: 10.3390/waste1020021.