

URBAN WASTE MANAGEMENT AS A GOVERNANCE CHALLENGE : POLICY IMPLEMENTATION AND ACTOR NETWORKS IN BATU CITY

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Abstract

Urban waste management remains a persistent governance challenge in rapidly developing cities, particularly those with tourism-driven economies. This study examines municipal solid waste management in Batu City, Indonesia, focusing on how local governance arrangements shape policy performance. The findings show that, despite the existence of local regulations aligned with national waste policy, implementation remains predominantly disposal-oriented and highly dependent on the Tlekung landfill. Upstream strategies, including waste reduction, segregation, and community-based waste banks, are weakly institutionalized, fragmented, and largely dependent on short-term projects rather than embedded governance mechanisms. These limitations are reinforced by constrained municipal budgets, uneven administrative capacity across governance levels, and the absence of stable coordination between government agencies, community groups, and private waste actors. Seasonal waste surges associated with tourism further strain existing service capacity and expose systemic vulnerabilities in local waste governance. This study highlights that the core challenge lies not in regulatory absence but in fragmented governance and limited cross-sectoral integration. Strengthening collaborative governance arrangements and institutionalizing community participation are essential to shifting urban waste management in Batu City from a disposal-centered approach toward more sustainable, resilient governance outcomes.

Keywords : Urban Waste Management; Policy Implementation; Collaborative Governance; Stakeholder Networks.

1. Introduction

The waste problem has evolved into an increasingly complex global issue, driven by population growth, urbanization, industrialization, and unsustainable consumption patterns. Each year, millions to billions of tons of solid waste are generated worldwide, particularly in urban areas, while waste management capacity has not developed at a comparable pace. Consequently, waste management has become a major challenge for sustainable development, especially in developing countries facing constraints in resources, infrastructure, and institutional capacity (Kaza, 2018; Wilson et al., 2012). Poorly managed waste generates severe environmental and public health impacts, including pollution and greenhouse gas emissions, particularly methane from landfills (Bogner J, 2008; Ferronato & Torretta, 2019). Plastic waste further amplifies the problem due to its persistence and transboundary impacts, threatening marine ecosystems and global food chains (Jenna R. Jambeck et al., 2015). Numerous studies emphasize that waste problems are not merely technical but also reflect governance and institutional challenges. Weak



inter-actor coordination, limited governmental capacity, and low levels of private sector and community participation are among the main factors constraining effective waste management systems (Abarca Guerrero et al., 2013; Wilson et al., 2012). This indicates that failures in waste management often mirror failures in public policy implementation and administrative systems in responding to complex environmental problems. Accordingly, global waste management requires a shift from the conventional “collect–transport–dispose” paradigm toward prevention-oriented and circular economy-based approaches supported by strengthened governance and cross-sectoral collaboration (Kaza, 2018).

Recent scholarship increasingly frames urban waste management not merely as a technical or operational issue, but as a governance challenge shaped by institutional capacity, policy design, and multi-actor interaction. (Abarca Guerrero et al., 2013) argue that in many developing cities, persistent waste problems stem less from technological limitations and more from weak institutional arrangements and fragmented coordination. Similarly, (Zhang & Lin, 2022) demonstrate that without policy integration and sufficient administrative capacity, urban waste strategies tend to become symbolic and fail to achieve systemic impact. (Thi Thanh Binh et al., 2025) further show that citizen engagement can significantly transform waste governance practices, particularly when supported by transparent information flows and collaborative platforms. From a network governance perspective, (Mishra et al., 2023) highlight how dysfunctional communication and misaligned incentives among government agencies, private actors, and community groups often undermine policy implementation. Taken together, these studies suggest that urban waste management operates within a complex governance arena in which implementation outcomes depend on institutional coherence, actor alignment, and the quality of interorganizational relationships.

Previous studies indicate that the challenges of waste management in Indonesia are not merely technical in nature, but also structural within the domains of policy and governance. An evaluative study of the Gunung Panggung Landfill in Tuban revealed that waste management policy implementation has not yet met the criteria of effectiveness, equity, and public responsiveness due to limitations in local regulations, technical resources, and low levels of community participation, resulting in suboptimal institutional performance in delivering public services (Mayangkara et al., 2016). Furthermore, the study *Environmental Impact of Community-Based Waste Management* in Plosojenar, Ponorogo highlights the environmental implications of community-based waste management approaches, emphasizing the role of local communities as integral components of the urban waste governance system and reinforcing the importance of public participation and actor collaboration for sustainable waste management (Sukoco et al., 2024). More recent research examines waste management education and training in Magelang City as a form of local government facilitation in support of the ProKlim program on organic and inorganic waste management. This study demonstrates that actor capacity-building, particularly involving the Environmental Agency (DLH) and the community, constitutes a crucial component in environmental policy implementation (Lana Saputra & Gratiano Mali, 2025). In addition, an article analyzing waste management policy implementation in Batu City from a Good Environmental Governance perspective underscores the need to strengthen local regulations (through mayoral regulations or local bylaws) and incentive–sanction systems to enhance policy



effectiveness, while also illustrating the complexity of actor networks involving government institutions, communities, and local organizations in addressing microplastic issues and strengthening urban environmental governance (Purwaningsih et al., 2025). Collectively, these studies suggest that research on urban waste management in Indonesia emphasizes the interconnection between policy design, institutional capacity, actor participation, and local implementation as central dimensions in addressing urban waste governance challenges.

In Indonesia, waste management challenges reflect broader issues of urban development and environmental governance. With a population exceeding 270 million and rising urbanization, national waste generation increased from approximately 64 million tons in 2019 to around 68.5 million tons in 2023 (Kementerian Lingkungan Hidup dan Kehutanan, 2024). Organic waste dominates the waste composition (40–45%), followed by plastic waste (around 15%), indicating significant potential for upstream management approaches such as composting and recycling. However, these opportunities remain underutilized due to technological, institutional, and local government capacity constraints (BRIN Public Relations, 2024). Approximately 35–40% of waste remains inadequately managed, contributing to environmental pollution and disaster risks such as flooding (BRIN Public Relations, 2024). Despite the existence of Law No. 18 of 2008 on Waste Management, implementation at the local level continues to face challenges related to limited budgets, weak coordination, and low stakeholder participation (Verawati & Tuti, 2020). At the local level, waste management in Batu City, East Java, exhibits distinctive dynamics as a tourism-oriented city with high visitor intensity. Daily waste generation averages 130–140 tons and can rise to approximately 158 tons during peak holiday periods, placing serious pressure on the capacity of the Tlekung Landfill, which is approaching its operational limit (Wijaya, 2022). Although Batu City has established a relatively comprehensive regulatory framework through Regional Regulation No. 2 of 2014, Mayor Regulation No. 67 of 2018, and Mayor Regulations No. 66 of 2020 and No. 73 of 2021, implementation remains suboptimal (Dye, 2023). Limited TPS3R infrastructure, uneven community capacity, and inconsistent source separation practices continue to constrain effective waste reduction efforts, illustrating a clear gap between policy design and implementation outcomes (Mualimah et al., 2024).

Although previous studies have examined waste management from environmental, technical, and sustainability perspectives (Ferronato & Torretta, 2019; Kaza, 2018), most analyses focus on system performance and environmental impacts rather than on the administrative mechanisms that shape policy implementation outcomes. Studies such as (Abarca Guerrero et al., 2013) and (Abarca Guerrero et al., 2013; Wilson et al., 2012) highlight institutional weaknesses and stakeholder coordination issues but do not systematically analyze how specific policy implementation variables interact within a structured implementation framework. In the Indonesian context, (Verawati & Tuti, 2020) emphasize regulatory and participation challenges, while (Mualimah et al., 2024) focus on infrastructure and community practices; however, these studies do not explicitly integrate classical policy implementation theory with collaborative governance analysis, nor do they situate waste management implementation within a tourism-driven urban governance context. Consequently, important analytical gaps remain regarding how governance capacity, stakeholder networks, and inter-organizational dynamics jointly influence policy implementation performance. This study addresses these gaps by applying the Van Meter



and Van Horn policy implementation model as a primary analytical framework while integrating collaborative governance perspectives to examine how stakeholder networks condition implementation effectiveness in Batu City. Unlike studies that treat collaboration normatively, this research conceptualizes collaborative governance as an empirical condition shaping coordination, compliance, and administrative performance. The novelty of this study lies in its integration of classical policy implementation theory with stakeholder network analysis, its empirical focus on a tourism-driven urban context characterized by fluctuating waste generation, and its positioning of waste management as a problem of public administration and governance capacity rather than merely an environmental issue. Accordingly, the main contribution of this article lies in the field of public administration and governance, advancing implementation theory by demonstrating how governance capacity and actor-network configurations mediate policy outcomes in complex urban environmental systems. The objective of this study is to analyze the stakeholder network involved in implementing waste management policies in Batu City and to identify the supporting and inhibiting factors affecting policy implementation in a tourism-driven urban environment.

2. Methods

This study adopts a qualitative case study design to examine stakeholder networks and governance dynamics in the implementation of municipal solid waste management policy in Kota Batu, Indonesia. A qualitative approach is appropriate for capturing the complexity of multi-actor policy implementation processes, including inter-organizational coordination, institutional roles, and context-specific constraints that cannot be adequately explained through quantitative measures (Creswell & Cheryl N. Poth, 2017). The focus of the study is not solely on policy outcomes but on how implementation unfolds through interactions among governmental, community, and private actors.

The case study maps the roles, interests, and relationships of key stakeholders involved in urban waste management. Government actors include the Environmental Agency (Dinas Lingkungan Hidup/DLH) as the lead implementing authority, the Department of Public Works and Spatial Planning (DPUPR), the Department of Housing and Settlement Areas (DPKP), and the Regional Development Planning, Research, and Innovation Agency (Bappelitbangda). Non-government stakeholders comprise sub-district and village administrations, managers of community-based waste banks, environmental community groups, and private actors engaged in partnership-based waste services, as mandated by local waste management regulations.

Data were collected over a six-month period in 2025 to capture routine implementation practices and coordination dynamics. A total of 15 informants were selected through purposive sampling. This number was considered sufficient to achieve analytical saturation, as recurring themes related to coordination, resource constraints, and institutional fragmentation emerged consistently across interviews. Informants were selected based on three criteria: (1) direct involvement in policy formulation or implementation; (2) institutional responsibility for coordination, service delivery, or community engagement; and (3) substantive experience with waste management practices in Kota Batu. The composition of informants ensured representation across policy-making, implementation, and community-based operational levels.

Data collection relied primarily on semi-structured in-depth interviews to explore



implementation processes, stakeholder roles, coordination mechanisms, and perceived challenges (Yin, 2018). To contextualize the interview findings, a document analysis was conducted of local regulations, agency strategic plans, performance reports, and policy-related documents. Limited field observations complemented these sources by capturing everyday service delivery practices and inter-actor interactions.

Data analysis followed a thematic and interpretative approach, emphasizing stakeholder network dynamics, including patterns of interaction, influence, and resource flows. The analytical process involved iterative stages of data reduction, data display, and conclusion drawing (Miles, 2014). Validity and credibility were ensured through triangulation of data sources (interviews, documents, and observations) and methods, allowing cross-verification of findings and reducing single-source bias. This triangulation strengthened the robustness of interpretations regarding collaborative waste governance and implementation constraints in Kota Batu.

3. Results and Discussion

In recent years, waste management conditions in Batu City have exhibited notable dynamics in line with increasing urban activities, population growth, and the intensity of tourist arrivals. Data from the Batu City Environmental Agency (Dinas Lingkungan Hidup/DLH) indicate that total municipal solid waste generation reached approximately 52,910.59 tons per year in 2024, with an average daily volume of around 145 tons. In 2025, total waste generation declined to approximately 44,178.87 tons per year, equivalent to an average of 121 tons per day. This reduction represents a decrease of about 8,732 tons annually compared to the previous year. Nevertheless, even though approximately 89.88% of total waste generation has been managed, DLH records show that around 10.12% or roughly 16 tons of waste per day remains uncollected or unmanaged, posing ongoing environmental challenges within the urban area.

The increasing volume of waste in Batu City not only puts pressure on upstream efforts, such as waste reduction and source separation, but also directly affects the capacity of downstream facilities. Tlekung Landfill (TPA Tlekung), the sole final disposal site serving Batu City, has reportedly been operating at overcapacity for several years. According to an assessment conducted by WALHI East Java, waste accumulation at TPA Tlekung has reached approximately 30 meters, far exceeding its original design capacity, which was intended for only 9 years of operation. This situation raises serious environmental risks, including potential pollution and surface landslide hazards in surrounding areas. These pressures are further exacerbated during peak tourism periods, when daily waste generation can reach 158 tons, significantly exceeding the landfill's daily processing capacity. Given the increasing waste volume and the landfill's limited infrastructure, final waste management in Batu City faces critical challenges, including uncontrolled waste accumulation, leachate pollution risks, and growing social pressure from nearby communities demanding more comprehensive and integrated solutions.

From an institutional and regulatory perspective, waste management in Batu City is governed by a multi-layered policy framework at both national and local levels. At the national level, waste management is anchored in Law No. 18 of 2008 on Waste Management, which emphasizes a paradigm shift from disposal-oriented practices toward sustainable waste reduction and handling. This legal framework is further operationalized through Government Regulation No.



81 of 2012 on the Management of Household Waste and Waste Similar to Household Waste, and reinforced by Presidential Regulation No. 97 of 2017 on the National Policy and Strategy (Jakstranas) for Household Waste and Waste Similar to Household Waste Management, which sets national targets for waste reduction and handling (Verawati & Tuti, 2020).

At the local level, the Batu City Government has enacted several regulations to support waste management implementation. An early regulatory foundation is Local Regulation (Perda) of Batu City No. 17 of 2010 on Solid Waste and Sanitation Service Fees, which positions waste management as a public service requiring sustainable financing mechanisms (Fariz et al., 2024). This regulatory framework was subsequently strengthened by Batu City Local Regulation No. 2 of 2014 on Waste Management, which serves as the primary legal basis for municipal waste governance by emphasizing waste reduction, waste handling, stakeholder roles, and community participation. In alignment with national policy, the Batu City Government also issued Mayor Regulation (Perwali) No. 67 of 2018 on the Regional Policy and Strategy (Jakstrada) for the Management of Household Waste and Waste Similar to Household Waste, outlining local targets and strategic directions.

To enhance operational implementation, the Batu City Government later introduced Mayor Regulation No. 66 of 2020 on Waste Management Guidelines, which provides technical guidance for waste management practices, including institutional arrangements, operational mechanisms, and stakeholder roles. Overall, waste management conditions in Batu City demonstrate that a relatively comprehensive and layered regulatory framework is already in place. However, the effectiveness of waste management outcomes remains highly dependent on policy implementation consistency, institutional capacity, and the extent of community and business actor participation in supporting source reduction.

Implementation of Waste Management Policy in Batu City

Public policy remains a foundational concept in contemporary public administration, particularly in understanding how governments respond to increasingly complex public problems. In recent literature, public policy is commonly defined as a set of authoritative decisions and actions undertaken by public actors to address collective issues. Understanding Public Policy conceptualizes public policy as the choices governments make, including decisions to act or deliberately refrain from action, emphasizing that both forms have tangible consequences for society (Dye, 2023b). This definition highlights the political nature of policy decisions and their binding effects on citizens.

Modern public policy scholarship increasingly emphasizes policy as a dynamic and goal-oriented process rather than a single governmental decision. Public Policymaking argues that public policy consists of interrelated actions taken over time by multiple actors within institutional settings to address public problems (Anderson, 2020). This process-oriented perspective underscores that policy outcomes are shaped not only by formal decisions but also by interactions among actors, rules, and resources throughout the policy process.

The analytical understanding of public policy has also evolved through refined process and systems-based approaches. Contemporary adaptations of the policy cycle, agenda setting, formulation, decision-making, implementation, and evaluation, remain widely used as heuristic



tools for policy analysis. Theories of the Policy Process emphasize that policy change and performance are best understood by examining long-term interactions among advocacy coalitions, institutions, and belief systems across policy subsystems (Sabatier & Weible, 2023). This approach reflects a shift from linear policymaking models toward more complex and adaptive understandings of policy dynamics.

Policy implementation continues to be recognized as a critical determinant of policy success or failure. Recent studies reaffirm that implementation gaps often arise from fragmented authority, limited administrative capacity, and weak interorganizational coordination. Building on classical insights, contemporary implementation research highlights the importance of street-level discretion, institutional learning, and contextual adaptability in translating policy objectives into practice (Hill & Hupe, 2022). These perspectives suggest that effective implementation requires more than regulatory clarity; it depends on governance capacity and institutional alignment.

In line with governance-oriented paradigms, the recent public policy literature increasingly frames policymaking as a collaborative and networked process. Governments are no longer viewed as the sole policy actors, but rather as part of broader governance networks that include private-sector entities, civil society organizations, and local communities. This shift is particularly evident in policy areas characterized by high uncertainty and complexity. Scholars argue that such “wicked problems” necessitate collaborative governance arrangements that enable shared problem-solving, joint decision-making, and mutual accountability among stakeholders (Ansell & Torfing, 2021). Overall, recent public policy literature converges on the view that effective public policy outcomes depend on the interaction between sound policy design, institutional capacity, and inclusive governance processes.

Public policy is often conceptualized as a connected sequence of stages that begins with the recognition of public problems and continues through policy evaluation, providing an analytical lens for understanding how policies are developed, implemented, and evaluated. Recent public policy scholarship identifies these stages as agenda setting, policy formulation, decision-making, implementation, and evaluation, while acknowledging that in real-world contexts, the policy process rarely follows a strictly linear path.

The policy implementation framework developed by Van Meter and Van Horn is widely recognized as one of the most influential classical models in the field of public policy implementation studies. This model conceptualizes implementation as a dynamic process that connects policy decisions to actual on-the-ground performance. It emphasizes that successful implementation depends not only on the soundness of policy design but also on a range of contextual factors that shape how policies are carried out in practice. According to Van Meter and Van Horn (1975), policy implementation refers to the actions undertaken by individuals or groups in both the public and private sectors to achieve objectives established in prior policy decisions (Van Meter & Van Horn, 1975).

Within this framework, six key variables are identified as determinants of implementation performance. The first variable is policy standards and objectives, which relate to the clarity, consistency, and feasibility of policy goals. When policy objectives are vague or ambiguous, implementers may interpret them differently, leading to uneven outcomes. The second variable



concerns resources, encompassing human resources, financial capacity, time, and technical expertise available to implementing agencies. Insufficient resources are a frequent constraint on effective implementation.

The third variable involves the characteristics of implementing organizations, including bureaucratic structures, internal norms, and patterns of interaction among organizational units responsible for implementation. Highly hierarchical or fragmented organizational arrangements can impede coordination and reduce implementation effectiveness. The fourth variable is the disposition or attitudes of implementers, which refers to the extent to which policy actors understand, accept, and are committed to policy objectives. Implementer support is critical, as policies ultimately depend on frontline actors for execution.

The fifth variable is interorganizational communication and implementation activities, covering information flows, coordination mechanisms, and message consistency among relevant actors. Weak or inconsistent communication can result in policy distortion and implementation failure. The sixth and final variable concerns social, economic, and political conditions, representing the external environment in which implementation occurs. Factors such as political support, local economic circumstances, and societal characteristics can either facilitate or undermine policy implementation outcomes.

This study examines the implementation of the solid waste management policy in Batu City using the Van Meter and Van Horn policy implementation model. The analysis is based on data collected through in-depth interviews and field observations conducted at key implementing institutions, namely the Environmental Agency (Dinas Lingkungan Hidup/DLH) as the leading sector, the Department of Public Works and Spatial Planning (DPUPR), the Department of Housing and Settlement Areas (DPKP), and the Regional Development Planning, Research, and Innovation Agency (Bappelitbangda) of Batu City. The findings indicate that although the regulatory framework governing waste management in Batu City is relatively comprehensive and multilayered, its practical implementation continues to face several operational challenges.

a. Policy Standards and Objectives

Interview results reveal that the standards and objectives of Batu City's waste management policy have been clearly formulated and are aligned with national regulations, including Law No. 18 of 2008, Government Regulation No. 81 of 2012, and Presidential Regulation No. 97 of 2017. These national policies are further translated into local regulations through Batu City Regional Regulation No. 2 of 2014, Mayor Regulation No. 67 of 2018 (Jakstrada), and Mayor Regulation No. 66 of 2020. Nevertheless, field evidence shows that strategic policy objectives, such as waste reduction at source and enhanced community participation, have not yet been fully operationalized into measurable performance indicators. As a result, policy implementation tends to focus on downstream waste management activities, particularly collection, transportation, and final disposal.

b. Resources

Resource availability emerges as a critical factor influencing policy implementation. The Environmental Agency of Batu City faces constraints in human resources, budget allocation, and supporting facilities, particularly in implementing waste reduction programs and community-based waste management initiatives. DPUPR highlights that the development and



maintenance of waste management infrastructure, including transportation fleets and landfill facilities, have not kept pace with the increasing volume of waste, especially during peak tourism seasons. Meanwhile, DPKP encounters limitations in integrating waste management concerns into residential area management. These conditions suggest that existing resources are insufficient to achieve policy objectives optimally.

c. Characteristics of Implementing Organizations

The characteristics of implementing organizations also shape the performance of waste management policy implementation. DLH plays a dominant role in technical operations, particularly waste collection and landfill management. DPUPR concentrates on infrastructure provision, while DPKP addresses environmental management within residential areas. Bappelitbangda is responsible for planning and cross-sectoral coordination. However, observational findings indicate that inter-agency collaboration remains largely sectoral and has yet to be fully integrated. Existing coordination mechanisms are primarily administrative and planning-oriented, while operational-level synergy remains limited. This fragmentation of roles contributes to suboptimal integrated waste management.

d. Disposition or Attitudes of Implementers

Regarding implementers' disposition, interviews indicate that public officials generally possess a normative understanding of and commitment to the objectives of waste management policy. Agencies such as DLH and DPKP acknowledge the importance of waste reduction and community participation. However, in practice, policy implementation remains dominated by administrative routines and procedural compliance. Policy innovation and initiatives to reduce waste at the source remain limited, constrained by inadequate incentives, organizational culture, and a tendency toward risk aversion.

e. Interorganizational Communication and Coordination

Communication and coordination among organizations represent a major challenge in policy implementation. Although Bappelitbangda facilitates formal coordination forums through planning mechanisms and inter-agency meetings, the study finds that information exchange among agencies is neither intensive nor continuous. Coordination is more effective during the planning stage than in day-to-day operational implementation. This condition creates gaps between policy planning, infrastructure provision, and field-level operations.

f. Social, Economic, and Political Conditions

External environmental factors further affect the implementation of waste management policy in Batu City. As a tourism-oriented city, fluctuations in visitor numbers lead to significant increases in waste generation during certain periods, placing additional pressure on the waste management system. From a social perspective, public awareness and participation in waste sorting and reduction vary considerably. Although local regulations promote community involvement, field practices show that compliance with waste segregation remains suboptimal. Politically, waste management receives normative support, yet it often competes with other development priorities in terms of budget allocation and policy attention.



Table 1. Policy Implementation Analysis Based on the Van Meter and Van Horn Model:
Empirical Findings from Batu City

Analytical Variable (Van Meter & Van Horn)	Empirical Findings in Batu City
Policy Standards and Objectives	Waste management policies in Batu City are normatively clear and aligned with national regulations. However, strategic objectives such as waste reduction at source and increased community participation have not been fully translated into operational, measurable indicators. Consequently, implementation remains focused on downstream activities, particularly waste collection and final disposal.
Resources	The Environmental Agency (DLH) faces limitations in staffing, budget, and supporting facilities, particularly for waste reduction and community-based programs. DPUPR reports that waste infrastructure development, including transport fleets and landfill facilities, has not kept pace with increasing waste volumes, especially during peak tourism periods. DPKP also experiences limited capacity to integrate waste management into residential area governance.
Characteristics of Implementing Organizations	DLH plays a dominant role in technical waste operations; DPUPR focuses on infrastructure provision; DPKP addresses residential environmental management; and Bappelitbangda coordinates planning. However, inter-agency collaboration remains sectoral, with limited operational integration. This fragmentation weakens the effectiveness of integrated waste management.
Disposition of Attitudes of Implementers	Implementing officials generally demonstrate normative commitment to waste management goals, including waste reduction and public participation. Nevertheless, implementation is largely characterized by administrative routines and procedural compliance. Policy innovation and source-based waste reduction initiatives remain limited due to weak incentives, organizational culture, and risk-averse behavior.
Interorganizational Communication and Coordination	Formal coordination forums, facilitated by Bappelitbangda, exist, mainly during the planning stages. However, day-to-day operational coordination and continuous information exchange among agencies are limited, leading to gaps between policy planning, infrastructure provision, and field-level implementation.
Social, Economic, and Political Conditions	As a tourism city, Batu experiences significant fluctuations in waste generation, placing increased pressure on its waste management systems. Public awareness and compliance with waste sorting vary, and community participation remains suboptimal. Politically, waste management receives normative support but often competes with other development priorities in budget allocation and policy attention.

Source : Author Analysis, 2025

Table 1 provides the diagnostic architecture, while Table 2 supplies the relational anatomy of implementation. Their convergence indicates that the primary implementation problem in Batu City is not the absence of policy commitment, but rather institutional



fragmentation, resource asymmetry, and insufficient integration of community-based and cross-sectoral actors within the governance network. Table 1 adopts a variable-based approach grounded in the Van Meter and Van Horn model, emphasizing six determinants of implementation performance: policy standards, resources, organizational characteristics, implementer disposition, interorganizational communication, and socio-political conditions. This framework diagnoses systemic constraints, particularly resource scarcity, sectoral fragmentation, and weak operational coordination. In contrast, Table 2 disaggregates these structural variables into concrete institutional actors (DLH, DPUPR, DPKP, Bappelitbangda, community, tourists, and informal sector actors), clarifying their respective roles, network positions, empirical challenges, and strategic importance. Thus, Table 2 translates abstract variables into relational dynamics of governance within the local policy network.

Table 2.
 Actor Mapping and Role Analysis in Waste Management Policy Implementation in Batu City

Actor	Primary Role in Implementation	Position in Policy Network	Key Empirical Findings	Strategic Importance
Environmental Agency (DLH)	Technical implementation: waste collection, transportation, landfill management, and operational programs	Core implementer / leading sector	DLH dominates downstream waste management activities but faces constraints in human resources, budget, and facilities, particularly for waste reduction and community-based initiatives	Highly critical; DLH determines day-to-day policy performance and directly affects service outcomes
Department of Public Works and Spatial Planning (DPUPR)	Provision and maintenance of waste-related infrastructure (fleet, roads, landfill facilities)	Supporting technical actor	Infrastructure development has not kept pace with rising waste volumes, especially during peak tourism seasons	Strategic for long-term sustainability; infrastructure gaps limit policy effectiveness
Department of Housing and Settlement Areas (DPKP)	Integration of waste management into residential and settlement governance	Supporting sectoral actor	Limited institutional capacity to mainstream waste management in residential planning and housing programs	Moderately important; acts as a bridge between technical waste management and community-level implementation



Actor	Primary Role in Implementation	Position in Policy Network	Key Empirical Findings	Strategic Importance
Regional Development Planning, Research, and Innovation Agency (Bappelitbangda)	Policy planning, coordination, and cross-sectoral integration	Strategic coordinator / steering actor	Coordination mainly occurs at the planning stage; operational-level integration remains weak	Crucial for policy coherence; weak operational coordination reduces overall policy integration
Local Community (Residents)	Waste sorting, reduction at source, participation in community-based waste programs	Target group & co-producer	Public awareness and compliance with waste segregation vary; participation remains suboptimal	Essential for upstream waste reduction; without community compliance, policy goals cannot be achieved
Tourists and Visitors	Indirect waste generators influencing waste volume	External pressure actor	Seasonal tourism significantly increases waste generation, straining local waste management capacity	Structurally important; tourism dynamics shape waste flows and policy pressure
Community-Based Organizations & Informal Sector	Waste sorting, recycling, and informal waste recovery	Complementary non-state actor	Their role is not yet fully institutionalized within formal waste governance	Potentially high impact; can strengthen waste reduction and circular economy practices

Source : Author Analysis, 2025

Institutional analysis and actor positioning are essential for understanding how waste management policy in Batu City operates in practice and why implementation gaps persist despite a relatively comprehensive regulatory framework. The findings indicate that waste management implementation in Batu City forms an asymmetric actor network characterized by the dominance of technical agencies, fragmentation across local government institutions, limited integration of non-state actors, and structural pressures arising from its tourism-driven economy. These structural conditions collectively shape policy orientation and constrain the system's capacity to move beyond downstream waste handling toward more preventive and collaborative approaches.

First, the Environmental Agency (DLH) occupies the most dominant position within the implementation network, particularly in operational and technical aspects such as collection, transportation, and final disposal. While this dominance ensures continuity of service delivery, it simultaneously reinforces a downstream orientation, limiting institutional focus on waste reduction at source. Similar patterns have been observed in tourism-intensive cities such as Bali



and Phuket, where environmental agencies prioritize disposal management due to immediate service pressures, leaving upstream waste minimization underdeveloped (Abarca Guerrero et al., 2013; Wilson et al., 2012). In these contexts, technical dominance often emerges as an adaptive response to high waste generation but ultimately reproduces structural dependency on landfill systems.

Second, the fragmentation of roles among local government agencies, including DPUPR, DPKP, and Bappelitbangda, contributes to weak horizontal integration. Although Bappelitbangda plays a formal coordinating role at the planning stage, operational coordination remains sectorally compartmentalized. Comparable findings have been reported in Indonesian municipalities where planning institutions function administratively but lack enforcement leverage during implementation, resulting in parallel rather than integrated execution. Internationally, Southern European tourism cities exhibit similar governance fragmentation, in which infrastructure, planning, and environmental units operate under distinct sectoral mandates, constraining policy coherence despite advanced regulatory frameworks (Abarca Guerrero et al., 2013).

Third, non-governmental actors, including waste banks, TPS3R operators, and community-based organizations, remain positioned as policy targets rather than as institutionalized co-implementers. Although their involvement contributes to localized waste segregation efforts, their integration into formal governance structures remains limited. This pattern aligns with national findings showing that community participation in Indonesian waste management is often project-based rather than sustained and collaborative. In contrast, cities that institutionalize community co-production mechanisms achieve stronger upstream waste-reduction outcomes, highlighting the importance of governance design rather than mere participation rhetoric.

Fourth, Batu City's tourism context functions simultaneously as a structural pressure and a contextual differentiator. Tourist flows significantly increase waste generation when visitors are not embedded within formal responsibility mechanisms, intensifying operational burdens on DLH. Similar structural imbalances have been documented in rapidly developing tourism cities where seasonal waste surges exceed administrative capacity, reinforcing short-term disposal strategies over long-term preventive reforms. However, unlike some international cases where tourism businesses are systematically integrated into waste governance schemes, engagement of private tourism actors in Batu City remains uneven.

Comparatively, while previous studies have emphasized institutional weaknesses (Wilson et al., 2012), regulatory gaps (Verawati & Tuti, 2020), or infrastructure limitations (Mualimah et al., 2024), the Batu City case demonstrates how actor-network configuration mediates the effectiveness of policy implementation. The novelty of this study lies in identifying asymmetric actor dominance and fragmented collaborative integration as key structural determinants in a tourism-driven urban setting. Rather than viewing implementation challenges solely as resource deficits or regulatory shortcomings, this analysis highlights governance configuration as the central explanatory variable.

Regarding supporting and inhibiting factors, interviews with key stakeholders indicate that Batu City benefits from a relatively clear local regulatory framework that provides formal legitimacy and authority distribution. Local regulations and mayoral decrees serve as operational references for program execution, mirroring findings in other Indonesian cities where regulatory



clarity supports administrative stability. Organizational commitment within DLH also emerges as a supporting factor, particularly in efforts to develop TPS3R facilities and promote waste segregation campaigns. Community-based initiatives, such as waste banks, further extend policy reach at the neighborhood level, reflecting patterns observed in several Indonesian municipalities, where grassroots innovation supplements limited governmental capacity.

Nevertheless, these supporting factors operate within structural constraints. Fragmented interagency coordination, uneven private-sector engagement, and high volumes of tourism-generated waste continue to inhibit systemic transformation toward upstream reduction and circular practices. Comparative evidence from tourism-oriented cities suggests that without institutionalized collaborative governance arrangements, particularly mechanisms that integrate private tourism actors and formalize community co-production waste management systems, they remain disposal-dependent despite regulatory completeness.

Overall, the Batu City case reinforces broader international findings that waste management effectiveness is not determined solely by regulatory design or technical capacity but by the configuration and integration of actor networks within local governance systems. By situating the analysis within public administration and governance scholarship, this study contributes to understanding how asymmetric institutional arrangements condition policy implementation outcomes in complex, tourism-driven urban environments.

Supporting and Inhibiting Factors in Waste Management in Batu City

Analysis of Supporting Factors in Waste Management in Batu City

Based on interviews with key stakeholders, waste management in Batu City is supported by several structural and institutional factors. One of the main supporting factors is the availability of a relatively clear local regulatory framework, which provides legitimacy and policy direction for local government agencies and non-governmental actors in implementing waste management activities. Informants from local government institutions emphasized that local regulations and mayoral decrees serve as formal references for the distribution of authority, the determination of operational standards, and the implementation of waste reduction and handling programs at the local level.

Another important supporting factor is organizational commitment at the implementation level, particularly within the Environmental Agency as the leading sector. Interview findings indicate that implementing officials have a fairly strong understanding of the objectives of waste management policies, especially in reducing the burden on landfill sites and strengthening source-based waste management. This commitment is reflected in efforts to develop TPS3R facilities, conduct public outreach on waste segregation, and maintain regular coordination with village and sub-district governments.

In addition, the involvement of community groups and local organizations constitutes a significant supporting factor in the context of waste management in Batu City. Several informants highlighted the role of waste banks, community-based organizations, and TPS3R operators in actively promoting waste segregation and processing practices at the neighborhood level. The presence of these actors helps extend the reach of policy implementation and reduce full dependence on government-managed waste collection systems.



From a local perspective, Batu City’s character as a tourism-oriented city also serves as an indirect supporting factor. The pressure to maintain the city’s image and environmental quality encourages local governments and tourism-related business actors to be more responsive to issues of cleanliness and waste management. However, engagement levels vary across business actors.

Analysis of Inhibiting Factors in Waste Management in Batu City

On the other hand, the interview results also reveal various inhibiting factors that significantly affect the effectiveness of waste management policy implementation in Batu City. The primary inhibiting factor is the limited capacity of infrastructure and facilities, particularly waste processing facilities at the source level. Informants noted that the number and capacity of TPS3R facilities are not proportional to the volume of waste generated, resulting in a continued reliance on transporting waste to landfill sites (Momentum, 2023).

Another major inhibiting factor is the low consistency of community behavior in practicing waste segregation. Although socialization and awareness-raising activities have been conducted, interview findings indicate that waste segregation has not yet become an institutionalized daily practice among residents. Consequently, waste that has been segregated at the community level is often mixed again during transportation, reducing the motivation of community actors who have attempted to manage waste at the source.

Furthermore, fragmented coordination among local government agencies emerged as a significant barrier. Several informants reported that the division of roles among relevant agencies is not yet fully integrated, particularly in planning, budgeting, and supervision. This condition leads to waste management programs being implemented partially and less synergistically, even though they are normatively situated within the same policy framework.

Another inhibiting factor highlighted in the interviews is the limitation of human resources and budget, both at the level of local government institutions and community-based waste management operators. These limitations result in minimal technical assistance, weak supervision, and suboptimal development of waste-processing innovations that could significantly reduce the burden on landfill facilities.

Table 3. Supporting and Inhibiting Factors in Waste Management in Batu City

Aspect	Supporting Factors	Inhibiting Factors
Regulatory and Policy Framework	A relatively clear local regulatory framework through local regulations and mayoral decrees governing waste management from upstream to downstream.	Inconsistent implementation of regulations in practice and weak enforcement mechanisms.
Government Institutional Capacity	Strong commitment of the Environmental Agency (DLH) as the leading sector in implementing waste management policies.	Limited inter-agency coordination, particularly in planning and budgeting processes.
Facilities and Infrastructure	Availability of several TPS3R facilities and community-based	Insufficient number and capacity of TPS3R and waste processing facilities compared to the



Aspect	Supporting Factors	Inhibiting Factors
	waste management infrastructure.	volume of waste generated.
Community Participation	Active community initiatives such as waste banks and community-based waste management groups.	Low consistency of household-level waste segregation practices.
Resources	Implementing agencies possess a basic understanding of the objectives of waste management policies.	Limited financial resources and human capacity constrain supervision, innovation, and technical assistance.
Local Context	Batu City's status as a tourism destination encourages greater attention to cleanliness and environmental image.	High tourism activity increases fluctuations in waste generation, particularly during peak holiday seasons.

Source : Author Analysis, 2025

4. Conclusion

This study demonstrates that persistent waste management challenges in Batu City arise not from regulatory absence, but from weaknesses in policy implementation and local governance capacity. Although the municipal regulatory framework is broadly aligned with national waste management policy, implementation remains predominantly downstream-oriented, emphasizing waste collection, transportation, and landfill disposal. The analysis shows that limited resources, fragmented institutional responsibilities, weak inter-organizational coordination, and the lack of effective operationalization of policy objectives constrain the achievement of waste reduction and source-based management targets.

From a theoretical perspective, the findings reaffirm that regulatory completeness alone is insufficient to ensure effective policy outcomes in urban environmental governance. Applying the Van Meter and Van Horn policy implementation model, this study highlights how implementation performance is mediated by governance capacity and stakeholder network configurations. In the context of tourism-oriented cities such as Batu, fluctuating waste generation further complicates implementation processes and exposes the limitations of linear, state-centric implementation frameworks when applied to multi-actor policy environments.

This article contributes to the development of public policy implementation theory by extending classical implementation models toward a governance-sensitive perspective. It demonstrates that asymmetries in stakeholder power, institutionalized roles, and coordination mechanisms function as critical intervening variables shaping implementation outcomes. By foregrounding stakeholder networks and local governance capacity, the study offers a conceptual refinement that bridges traditional implementation theory with collaborative and network-based governance approaches, particularly in complex urban service sectors such as waste management.

Empirically, the case of Batu City illustrates how implementation remains dominated by technical government actors, while community groups, non-state actors, and informal waste sectors are weakly embedded within the formal governance structure. Rather than offering prescriptive solutions, this study provides an analytical foundation for understanding why policy intentions for waste reduction and sustainability often fail to materialize at the local level. Future



research is encouraged to pursue comparative and longitudinal studies across diverse urban economic contexts to examine further how governance capacity, actor configurations, and institutional learning shape the long-term effectiveness of public policy implementation.

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