INVISIBLE WASTE, VISIBLE CRISIS: A POLICY-PRACTICE GAP ANALYSIS OF SEMARANG TEXTILE WASTE MANAGEMENT (2018-2024)

A Thesis

Submitted to the Master's Study Program of Public Policy Specializing in Climate Change at the Faculty of Social Sciences in partial fulfilment of the requirements for the degree of

Master of Public Policy (M.P.P.)



by:

Kenan Wisaksena Hudawan

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UNIVERSITAS ISLAM INTERNASIONAL INDONESIA

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ABSTRACT

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Through Presidential Decree No. 97 of 2017 as the arching National Policy and Strategy for Household and Similar Waste Management, or abbreviated as Jakstranas (Kebijakan dan Strategi Nasional), the goal is to increase the Enhanced Nationally Determined Contribution (ENDC) by 31.89% on the unconditionally terms. The quantifiable national target is to reduce waste generated at the source by 30% and achieve a 70% waste treatment rate by 2025. As the implementing processes for this top-down national strategy, the local and municipal governments have to adapt to the significant responsibility handed towards them for managing and operating the process of the waste. Translating these targets into a set of technicalities on the level of local policies specific contexts. Semarang City, the capital of Central Java Province, were picked as it is a key focal point and representative example of this policy transformation. As the capital of Central Java, Semarang is facing rapid industrialization, putting pressure on its waste management infrastructure as it has the highest waste generated amongst the Central Java cities. However, at the regional technical implementation stage, regional policy development, as reflected in Semarang Mayor's Regulation No. 79 of 2018, has failed to adequately adapt by misaddressed the complexity of waste types and has focused only on organic and plastic waste volumes reflected in the content of the regulation documents. The lack of a separate classification for textile waste is a significant shortcoming that directly impacts strategic intervention tools at the city level. This study uses policy analysis to assess the structural design of current waste regulations and its adaptability towards the field actors. The policy-practice gap is used to examine the 2018 Mayor's Regulation on Textile Waste and whether the 2024 Master Plan is capable of addressing the practical issues. Data were collected from two sources: documents and field research with observations and interviews. The results showed that organizations were unable to adjust their operating practices to comply with current policy regulations (Adjusting practices to comply with policy) in both the 2018 and 2024 regulations, in contrast to the recognition of textile waste in the 2024 regulations.

Keywords**:** Waste, Management, Regulation, Textile, Policy

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ABBREVATION DIRECTORY

CIE	: *Communication, Information, and Education*
COP	: *Conference of the Parties*
ENDC	: *Enhanced Nationally Determined Contribution*
GHG	: *Greenhouse Gas*
Jakstranas	: *Kebijakan dan Strategi Nasional (National Policies and Strategies)*
Jakstrada	: *Kebijakan dan Strategi Daerah (Regional Policies and Strategies)*
NDC	: *Nationally Determined Contribution*
SME	: *Small and Medium Enterprise*
SIPSN	: *Sistem Informasi Pengelolaan Sampah Nasional (National Waste Management Information System*
TPA	: *Tempat Pembuangan Akhir (Landfill)*
TPS	: *Tempat Pembuangan Sementara (Temporary Disposal Site)*
TPST	: *Tempat Pembuangan Sementara Terpadu (Integrated Temporary Disposal Site)*
TPS3R	: *Tempat Pembuangan Sementara (Temporary Disposal Site for Reduce Reuse Recycle materials)*
UN	: *United Nations*
3R	: *Reduce, Reuse, Recycle*

CHAPTER I
INTRODUCTION

Waste management has become an increasingly serious problem in this world, including in Indonesia (Elizabeth et al., 2025). The accumulation of waste in various cities around the world will typically starts a multidimensional challenge that exponentially accelerating which eventually possess higher risk to threatens ecological sustainability, public health infrastructures, and urban resilience, particularly within the rapidly urbanizing contexts of developing nations. Globally, the volume of solid waste generated is increasing as a result of population density, economic growth, urbanization, and industrialization (Lissah et al., 2021). Rapid population growth, higher purchasing power, and the widespread use of linear economic models have led to waste production rates that significantly overtake the rate of the development of municipal waste facilities. These growing volumes of wastes and its issues will eventually pose severe threats to urban environments, including illegal dumping, groundwater contamination, greenhouse gas emissions, and unregulated landfill expansion (Ayeleru et al., 2021; Taweesan et al., 2025). Such conditions create fragile balance of proper waste management, which is highly prone to mismanagement or uncollected waste which includes a range of inadequate waste management outcomes, including uncontrolled landfilling, illegal dumping, open burning, littering, and the eventual leakage of waste into the environment (Frigo et al., 2025).

1.1. National Mandate (Jakstranas)

As a member in the Conference of the Parties (COP) in the UN and the world's fourth most populous nation, Indonesia actively participated in the effort to reduce global emission. The feel of urgency for a comprehensive, transformative waste governance construction has been officially recognized and legislatively mandated through Presidential Decree No. 97 of 2017 which mainly concerning about the National Policy and Strategy on the Management of Household Waste

and Household-like Waste, known as Jakstranas (Kebijakan dan Strategi Nasional) to achieve the targeted Enhanced Nationally Determined Contribution (ENDC) by 31.89% on an unconditionally terms. This arching national regulation established was set to an ambitious level, quantifiable national target of achieving 30% of reduction in waste generation at the source and a 70% rate of proper waste handling by the year 2025. Through this set of regulations, the country tries to abandoned the collect-transport-dispose system and shifted to a more systemic approach based on the Circular Economy approach that focuses on waste reduction at source upstream intervention, mainly by reduce, reuse, and recycle. By reducing waste disposal, particularly organic waste that decomposes through anaerobic processes, the rate of methane emissions into the atmosphere can be significantly reduced.

To achieve these targets, this policy focusing on 3R principle (Reduce, Reuse, Recycle) as the main system of its management strategy. In accordance to the ambitions of achieving those goals, besides the 30% waste reduction and 70% waste management by 2025, the other strategy is to strengthening the role of communities and the informal sector through the integration of facilities that starts from the starting point of the waste generation such as on a household level, temporary disposal site (TPS) and Waste Banks and Reduce, Reuse, and Recycle Waste Processing Facilities (TPS3R).

However, the effectiveness of the policy's macro-design has one structural vulnerability: it cannot operate independently. This Presidential Decree then serves the umbrella of authority and burden of technical implementation entirely to Regional Governments, which in the Indonesia's case would be on the level pf provinces and regencies then down to the cities level. It requires each city government to develop derivative regulations in the form of regional policies and strategies. This shows that to achieve the NDC targets, the effectiveness of the policy would be highly depending on the ability, capacity, and sensitivity of local governments in defining, categorizing, and formulating interventions against various types of local waste issues that occurs, including composite and synthetic waste such as textiles. This could translate into the scenario of failure at the local translation level will invalidate the entire vision and ambitions that has been formulated at the national level.

More fundamentally than its numerical targets, the Jakstranas explicitly trying to move saliently towards systemic paradigm shift, which in its program, it tries to moving away from traditional, linear waste disposal systems which characterized by the "collect-transport-dispose" operational model toward resource recovery, material retention, and the implementation of circular economy principles. It is necessary to pay close attention to how these regulations are issued and how the community's knowledge system is formed so that they carry out various waste management efforts (Elizabeth et al., 2025). As the implementation of this top-down national strategy, regional and municipal governments bear the heavy administrative and operational responsibility of translating these targets into actionable, context-specific local policies.

1.2 Semarang Textile Waste Management

Semarang City, the capital of Central Java Province, serves as a critical and highly representative focal point for this policy translation process. Being the capital of Central Java, Semarang facing rapid industrialization which causing waste infrastructure pressures. As the result, the city has the highest waste generation compared to other cities in Central Java (see figure 1.1.) The increase in post-consumer and pre-consumer textile waste, driven by the acceleration of trends such as fast fashion has emerged as a critical environmental challenge for urban waste management systems which possess its own set of risks. Ribić et. al. (2017) examine Zagreb’s waste management system and its integration of economic empowerment programs. Globally, the textile industry's shift toward synthetic fibres has severely complicated recycling efforts, creating a massive environmental footprint (Niinimäki et al., 2020).

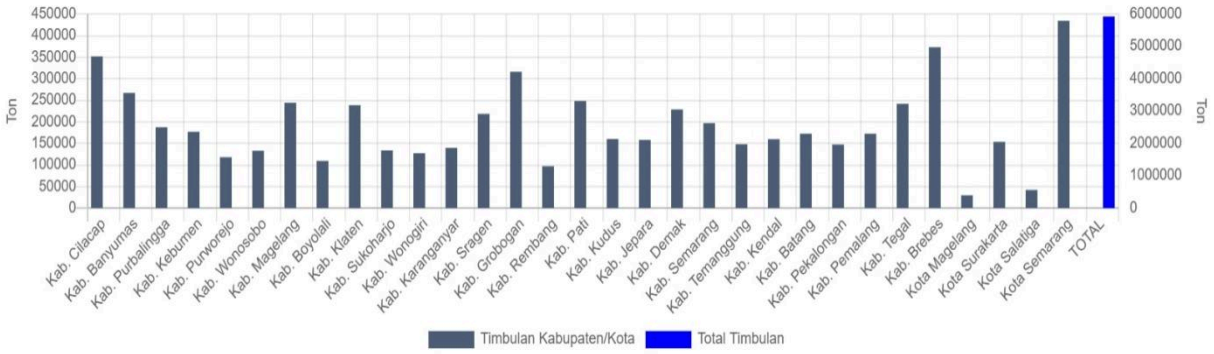


Figure 1.1

Waste generation of the cities in Central Java Province in 2024, which Semarang City has the highest waste generated (Source: SIPSN)

Textile waste management is a critical issue concerning greenhouse gas (GHG) emissions. The mismanagement of textile waste could lead to various carbon emissions, such as burning which the process releases massive amounts of carbon dioxide, black carbon, and other toxic pollutants into the atmosphere. Conversely, when textiles are disposed of in landfills and mixed with organic waste, the material would trigger the release of methane via anaerobic or decaying process. Failure to mitigate this waste leakage will directly affecting the ability to achieve the ambitious targets set out in its Enhanced Nationally Determined Contribution (ENDC) document regarding the significant reduction of GHG emissions from the waste sector.

In response, the Semarang City Government issued Mayoral Regulation (Peraturan Walikota) No. 79 of 2018 which later slightly updated in Mayoral Regulation No. 34 of 2019 concerning Regional Policies and Strategies (Jakstrada). This policy establishes a framework for urban waste management for the 2018–2024 period, setting various intervenes towards the management of waste handling to keep up with the national ambitious targets, which includes the implementation of producer obligations in the manufacturing and retail sectors, as well as the utilization of waste-to-energy technology. However, during its six-year

implementation (2018–2024), this policy revealed a structural weakness: the lack of specific recognition for textile waste. Unlike plastic waste, which has clearer derivative regulations, textile waste management operates with no specific technical guidelines mentioned anywhere in the regulation document for handling or clear categorization within regional priorities. This creates policy-practice gaps, which are understood as a failure of adapting ongoing practices to prescribed policies and/or to adapt policies to the complexities of ongoing practices (Martin et al., 2025).

The true scale of this neglected problem was only quantitatively revealed in the Mayoral Regulation No. 4 of 2024. The emergence of this data reveals a stark policy contradiction: for years, this large volume of textile waste has been treated simply as general residue due to the lack of specific policy instruments during the Mayoral Regulation No. 79 of 2018 implementations. This gap between the factual implementations conditions and the expected policy design outcomes creates systemic barriers. Although the Mayoral Regulation narratively mentions a strategy of partnering with producers, the absence of technical regulations has left the grassroot actors for textile recycling ecosystem such as Waste Banks and SMEs which highly possible to operate without standard guidelines.

Previous studies on Semarang have emphasized the crucial role of informal workers in plastic recycling networks (Samadikun et al., 2020) and noted the frequent disconnect between municipal policies (Kurniawan & A., 2024) and community-based environmental initiatives (Elizabeth et al., 2025). However, there remains a significant gap in the current literature regarding post-consumer textile waste in Semarang area. Specifically, little research addresses the governance frameworks, policy failures, bureaucratic transparency, and the micro-economic market dynamics surrounding this specific waste stream. Studies examining local compliance suggest that inadequate waste disposal practices at the domestic level significantly hinder progress toward an integrated solid waste management as knowledge of current practices and perception of household solid waste management is necessary for accurate decision making in the move towards a more sustainable approach (Fadhullah et al., 2022). In the specific context of Indonesia, the key structural challenges to sustainable waste management across expanding

urban communities, highlighting systemic infrastructural and administrative limitations (Rahmawati et al., 2021).

1.3 The Space for Textile Waste

According to Mayoral Regulation 2024, Jatibarang Landfill received a total of 253,412,273 tons, or 677,734 - 865,899 kg/day of waste in 2022. Textile waste contribute 8.818.746 kg, which made of 2.08% non-domestic (5.270.975 kg) and 1.40% (3.547.771 kg) domestic. The data compiled in the Regional Policy and Strategy Report for Household and Household-Similar Waste Management, which is compiled every six months, is based on data submitted to the Environmental Agency (DLH). If waste reduction actors do not submit data, it will not be included in the report.

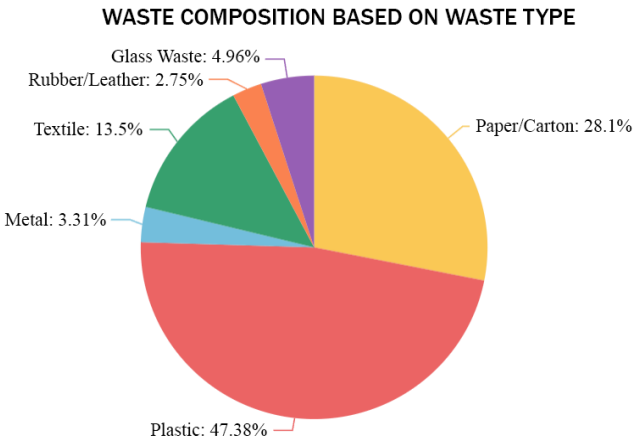


Figure 1.2.

Semarang Waste total from 2018-2025. (Source: SIPSN)

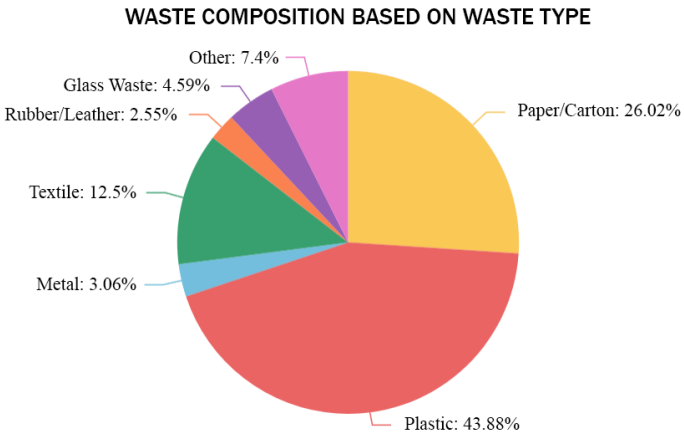


Figure 1.3.

Semarang inorganic waste composition in 2023. (Source: SIPSN)

Based on Figure 2 waste composition chart, the structure of waste generation in Semarang dominated by plastic waste which makes for the largest proportion due to high consumption of single-use packaging. Textile waste accounts for the third biggest contributor to the total inorganic waste compared, accounting for 13.5% of the total waste between 2018-2024. Administratively, this amount of percentage is too high to be justified as insignificant, which in this case is as reflected in Mayoral Regulation 2018 to exclude textile waste from the list of priority management in which ecologically and operationally, this interpretation is highly misleading.

When converted to tons of waste generated daily across the city, this small figure is equivalent to tens of tons of waste per day. Data according to SIPSN, Semarang recorded waste generation rate of 1,182.29 tons per day in 2023, according to the National Waste Management Information System (SIPSN), of which the total non-domestic waste (60.48% of total waste in Semarang), textiles contribute 12.5% (see figure 1.3.). Unlike biodegradable organic waste, or plastic waste with high economic value for the informal sector inline as stated in Samadikun et. al's (2020) research, synthetic textile waste (polyester) is not biodegradable. Which lead to the waste accumulates permanently in landfills, creating a build-up of waste that clogs landfill capacity year after year.

This study aims to analyse waste governance in Semarang City specifically on textile waste during the Mayoral Regulation 2018 (2018-2024) and Mayoral Regulation 2024 (2024-2026) period using the analytical lens of the Policy-Practice Gap. By understanding the formal policy documents with extensive corelations from the empirical field data consisting of direct observations at final landfills (TPA) Jatibarang and temporary disposal sites (TPS), as well as in-depth interviews with informal sector actors and small and medium enterprises, the study seeks to answer the research questions: How has the regulatory design of Semarang's waste management policy (Mayoral Regulations 2018) created structural barriers for textile waste handling, and to what extent does the latest masterplan (Mayoral Regulations 2024) address these gaps?

CHAPTER II
LITERATURE REVIEW

2.1. The Complexity of Waste Management

Municipal solid waste managements in developing countries characteristically faces significant structural challenges. Lissah et al. (2021), in their study in Ghana, identified that waste governance in the Global South is often slowed down or hindered by decentralization governance system, weak managerial capacity, and a lack of supporting infrastructure at the municipal or ground level. These institutional weaknesses directly impact waste management approaches that requires various strategies to handle different waste issues. Taweesan et al. (2025) also found that fragmented approaches in middle and low-income regions lead to operational ecosystem failure, where waste fails to be systematically channeled to safe disposal facilities. These challenges are further worsened by the unavailability and inaccuracy of waste data in developing countries, which Ayeleru et al. (2021) argue in their research, the biggest obstacle to sustainable governance planning. The absence of a precise monitoring framework at the local level often leads to bias in estimates of unmanaged waste, which also has a high chance to happens in regions in Indonesia.

This crisis in waste management, including textile waste handling itself need to be accommodated by the volume, record real data, and address the complexity. Looking at the research by Ballatore et al. (2022), the paper conceptualizes this phenomenon with the title "This City Is Not A Bin" which shows that the distribution of urban litter in urban areas is not random, but rather concentrated in areas with minimal regulatory oversight. In Indonesia, this geographic dimension of waste was studied by Frigo et al. (2025), which the research described those spatial variations in waste generation and illegal dumpsites are significantly influenced by the limitations of the built environment. Furthermore, research done by Rinasti et al. (2022) shows that the low priority of waste management in densely populated urban areas namely Jakarta and Bandung, via informal waste managing sites, triggers massive waste leakage into water bodies

and the open environment. In the context of Semarang City, this spatial perspective and systemic leakage explain why waste from garment-making SMEs accumulates in regular TPS (landfill) containers, then ends up as chronic ‘legacy’ waste at the TPA Jatibarang due to the absence of formal facilities and government data intervention.

2.2. Gap between National Mandates and Local Adaptive Capacity

To address the waste crisis, Indonesian government via Presidential Regulation Number 97 of 2017 (JAKSTRANAS) to issue the achievement of the country’s NDC target. Rahmawati et al. (2021) notes that this regulation was meant to help with the transition to sustainable waste management by mandating the adoption of waste reduction concept focusing at the urban level. However, at the regional technical adoption stage, regional policy formulation as reflected in Semarang Mayoral Regulation No. 79 of 2018, fails to map the complexity of waste materials and focus on organic and plastic volumes. The absence of a textile waste as its own category represents an undetailed flaw which directly affecting strategic intervention instruments at the regional level.

This flaw of undetailed regulation could be separating policy outcome expectation and implementations at the grassroots level. Recent studies on waste management in Semarang City record a disconnect between the government's narrative and the community's reality which demonstrated in the Elizabeth et. al. (2025) which described this condition through their research as government policies and community initiatives disconnection The absence of technical guidelines forces citizen and community initiatives to operate on their own without a clear guide or standardization. Furthermore, research by Kurniawan & Fuaddah (2024) found that waste management initiatives in Semarang (such as the Waste Bank program) tend to emphasize household awareness as the primary solution, while overlooking the state's neglected obligation to provide a macro-scale infrastructure facility and protect the recycling market, which shows the disproportionate city government's approach towards the issue.

CHAPTER III
METHODOLOGY

A qualitative empirical research design was employed for this study. Qualitative research produces descriptive data in the form of someone's words spoken or written or based on the results of observations by researchers (Elizabeth et al., 2025). This methodology enables the conceptualizing of public policy which not merely as administrative text, but could possibly dig deeper to understand the social phenomenon as a dynamic spatial, economic, and socio-political framework that actively shapes the behaviour of local actors, informal networks, and community initiatives. The utilization of qualitative methodologies for this research enables a better comprehension of the systemic disconnects between governmental regulations and the realities of ground-level execution run by the field actors.

Primarily, this study uses the policy analysis principles outlined by Weimer and Vining (2010) to evaluate the structural design of existing waste regulations. Understanding a policy problem will involves in assessing the conditions that concern the clients, which would need framing said clients as a market or government failures, broadly defined, and modelling the relationship between the conditions of the concern and variables that can be manipulated through public policy (Weimer & Vining, 2010).

Specific policy actions that can reduce the production of specific litter types can also play a role (Ballatore et al., 2022). Effective policy intervention requires a clear and accurate problem definition. In the context of field applications, if a regulation fails to define, categorize, or even acknowledge a problem such as the oversight of textile waste, it is fundamentally flawed which could lead to confusion. To examine why the 2018 Mayoral Regulation failed to address textile waste and whether the 2024 Masterplan is capable of addressing this crisis, 'policy-practice gap' framework by Martin et al. (2025) which conceptualizing policy-practice gap as a dual failure or dysconnectivity:

a. The failure of organizations to adapt field practices to existing policy regulations (adapting practice to policy).

b. The failure of organizations (government) to continuously revise or develop policies to suit the needs or realities of the field (adapting policy to practice or developmental learning).

3.1. Data Collection

This study was conducted specifically in Semarang city, Central Java, Indonesia. To capture the complex and often unclear dynamics between formal regulations and on-the-ground realities, this study uses a qualitative research design based on an exploratory and evaluative case study approach. Field research consists of talking to people, gathering raw data, or finding unpublished reports, memoranda, or other organizational documents (Weimer & Vining, 2010). Data were gathered with field research by thematic literature review focusing on the city's government waste policy documents, interviews, and observations. Case studies are relevant the more the questions require an extensive and in-depth description of some social phenomenon (Yin, 2017). This method was chosen because it allows for a deep analysis of the issues in caused by the undetailed technicalities in the regulation on real-world settings. Interview were conducted to the selected sources as instruments used to gather data, which fall along a continuum from structured with all questions are preselected and asked in a particular order to the participants, to unstructured, in which the researcher might use a single "grand tour" question (Jason & Glenwick, 2016).

This research limits to assessing the city's regulation regarding the textile municipal waste management. Municipal waste textiles comprised largely of post-consumer discarded clothing, carpet, curtains, residual worn-out clothing from the sale of imported "used" clothing, and pieces of unwanted fabric obtained from dressmaking and apparel alteration (Owusu et al., 2021).

The policy dimension is, in a sense, a "frozen system". It comprising a world of abstract concepts, models, visions and strategies that are intended to regulate the world of operations while the practice dimension, on the other hand, represents the implicit, usually hidden and seldom exhibited aspects of an organization and work (Martin et al., 2025). Hence, to understand both, a two-way analysis: observing how

grassroot actors struggle or adapt to comply with policy demands, and examining how the policies themselves fare in the practical field. To understand these issues regarding the textile waste, data were gathered from two primary sources.

1. **Document Analysis:** A comparative textual and structural review of Semarang municipal regulations was conducted. The primary statutory texts analysed were:
    - The national mandate: Presidential Regulation No. 97 of 2017 (*Jakstranas*).
    - The Mayor Regulation No. 79 of 2018 regarding the Regional Policy and Strategy for Waste Management (*Jakstrada*), which served as the guiding framework for the municipality's waste operations for a duration of six years.
    - The Mayoral Regulations No. 4 of 2024 regarding the Waste Management Masterplan (*Rencana Induk Pengelolaan Sampah Tahun 2023-2042*), which represents the municipality's current operational regulation.
    - Data collected from national government website National Waste Management Information System (SIPSN).
2. **Field Interviews and Direct Observations:** In-depth, semi-structured interviews and extensive field observations were conducted in February 2026 with a spectrum of key stakeholders within Semarang (see Appendix for detail).
    - **Interview Sources:**
        1. Upcycling enterprise and convection (clothes maker) business operating across various zones within the city.
        2. Scavengers (pemulung)
        3. The management of two separate waste aggregator drop points. The sites were selected based on their geographic location: one facility operates in close proximity to the TPA Jatibarang, while the other is situated much further away.
    - **Waste Management Facilities:** Direct observations and management interviews were conducted at the final landfill of the

waste: the Jatibarang Final Landfill (TPA Jatibarang). Additionally, observations were recorded at several localized Temporary Disposal Sites (TPS) to assess conditions at the initial point of community disposal.

3.2. Data and Procedures

This research employs thematic analysis which involves searching for recurring ideas (referred to as themes) (Jason & Glenwick, 2016). First, literature and text analysis of key policy documents, specifically Mayoral Regulations 2018 and Mayoral Regulations 2024. Review was relying for their specific technical guide, waste categorizations, and reduction targets based on Weimer and Vinings (2010) problem definition framework, the goal was to determine if municipal regulations formally recognized 'textiles' or 'clothing' in their structures. This phase aimed to prove whether the oversight of textile waste in policy directly caused its mismanagement in reality. Second, empirical data from the field was analysed. By reviewing interview transcripts and observation data, the analysis uncovered the struggles, economic drivers, and informal waste-handling strategies.

To analyse this, this research tried to correlate the sociological disconnect identified by Elizabeth et al. (2025) which better picture how grassroots actors are forced to operate intuitively because the lack official municipal guidance and support from the government. To systematically analyse the data collected from official documents, interviews, and field observations, this study employed a six-phase thematic analysis as described by Braun and Clarke (2006). The process is written below:

1. **Familiarizing with Data**: The first step involves repeatedly reading the interview transcripts and the observation notes.
2. **Forming Initial Codes**: marking keywords or highlighting important information from the raw data and converting them into codes based on types.

3. **Searching Themes**: combine and group the previously generated codes into several group types which in line with the themes.
4. **Reviewing Themes**: Validates the group types whether is it in line with the identified themes genuinely represent the original data and align with the research theoretical framework.
5. **Defining Themes**: assign clear and easily understandable names to the themes.
6. **Report**: Themes then narrated into result of the research which will answer the two research main questions.

This approach was chosen was it could help to identify recurring patterns, challenges, and contradictions related to the core research questions asked to sources. Finally, the findings were analysed manually based on Martin et al.'s (2025) policy-practice gap framework.

CHAPTER IV
RESULT AND DISCUSSION

The discussion is categorized based on the two main regulatory instruments that are the focus of the evaluation: Mayoral Regulation Number 79 of 2018 and Mayoral Regulation Number 4 of 2024.

4.2. The Implementations of Mayoral Regulation No. 79 of 2018

Mayor Regulation No. 34 of 2019 regulatory framework serves as the latest revision of Semarang Mayoral Regulation No. 79/2018, which originally outlined the city's Regional Policy and Strategy regarding the management of household waste and comparable commercial or institutional waste. From 2018 to 2025, this policy establishes the basic legal and operational guidelines governing how municipal waste is managed throughout the city. By definition, household waste includes all waste and discarded materials generated daily through routine household activities. Under this policy, the primary mechanism for efficiency relies on separation at source. If residents properly separate organic, recyclable, and hazardous waste at the household level before disposal, it dramatically reduces the total volume of unmanaged residual waste that ultimately ends up in local landfills.

Implementing household waste separation within households presents significant logistical and behavioural challenges. Because this process requires consistent effort, division of labour among all household members is crucial to prevent individual burnout and ensure long-term compliance. According to BPS data (2018) in the Environmental Carelessness Index Report, it is stated that the level of public concern for the environment is still low at 0.75 and it is found in most people who buy and use products with minimal considerations for pro-environment actions, neglecting 3R behaviour in using goods, which leads to an increase in waste generation (Rahmawati et al., 2021).

To systematically address these challenges, the Semarang City Government formulated a strategic framework divided into two main policy directions:

optimizing the reduction of household and similar waste, and improving the processing and handling of these waste streams. This government strategy reveals that it primarily intends to positions the community as the policy target. This approach is evident in efforts to increase public engagement through targeted communication, information, and education (CIE) initiatives.

Quite contrasting from the regulation, we found that the programs in the policy has never been realized. The plan of community education and awareness strengthening were ineffective as it was stated by the owners of an upcycling small and medium enterprise:

"We do understand the point of waste treatment needs to start from the household. We do the separation for our business production process and house waste based on our own initiatives. But we do not aware of the regulations, or any of its content to manage waste. We mostly operate on or own. We try to contact the government's agency (DLH) several times, but they gave no response or support."

The condition experienced by the upcycle business owner were confirmed by the owner of a small and medium enterprise-scale convection business, as stated below:

"We used to dispose our waste in the canal (Banjir Kanal Barat), but we do it no more because it feels wrong. The government (DLH) never gives us any kind of guidance, penalty, or giving incentives. They were never approach our business. We now treat our production waste, which mostly leftover fabrics that has been cut, by collecting it in a big polybag, then store it until a waste aggregator comes to buy and pick it up. Unfortunately, there are no waste aggregator comes to pick it up for quite a long time and we do not know the reason. Now it's (the fabric waste) just piling up and we do not know what to do with it."




Figure 4.1. and 4.2.

The convection production process waste.

Similar case also found in a small and medium enterprise focusing on denim product making and alteration services:

"Even though we are small in scale, but we got to admit we produce a lot of denim fabrics leftover from our production. We reuse some of the fabrics for denim services such as patching blown jeans, but there's a lot of fabrics leftover too small to use."

The Jatibarang Landfill is physically filled with layers of fabric wastes (see figure 4.3.). From final dumpster site management's pointed location, they estimated the garbage's are from the research appointed timeframe (2018-2024). We found that there are the remains of organic waste (such as chicken bones, noodles still intact in packaging, eggshells etc.) mixed with inorganic waste. Along those mixes, we found a lot of textile fabrics which are tattered and hardened from the elements. As the fabrics degraded overtime, it was quite hard to tell which fabric is cotton and which is polyester, and which is both (poly-cotton blend). The mixing of this waste intensifies anaerobic conditions which could triggering massive methane emissions.

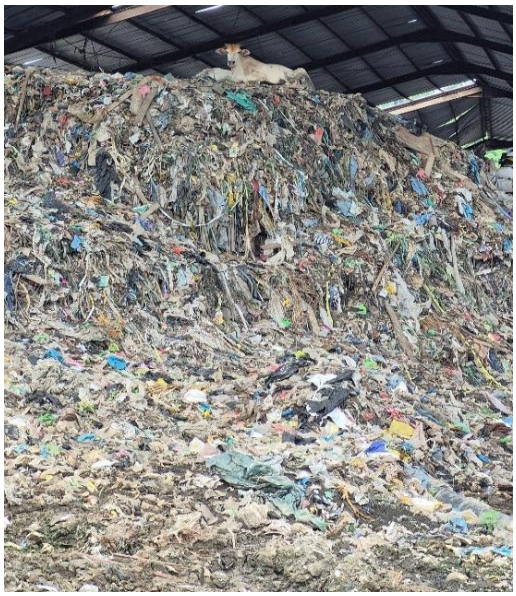


Figure 4.3.

Textile wastes found in TPA Jatibarang, mixed with another organic and inorganic materials.

The structural barrier to the implementation of the 2018 Mayoral Regulation manifests itself in the informal economy. The lack of regulations regarding textile waste has disordered the informal recycling supply chain.

In this Mayoral Regulation, operational definitions and specific reduction targets for waste are explicitly stated, but the policy structure saliently focuses on the management of organic and plastic waste, which have historically been considered primary urban waste commodities (Samadikun et al., 2020). Citing from the regulation document, the current waste reduction rate is 5.11%, consisting of a 0.07% reduction in waste and 5.04% in recycling, including landfill collection with scavengers or waste aggregators as the largest contributor to waste reduction, particularly scavengers at TPA Jatibarang. These conditions made the textile waste often overlooked, as stated by the management of waste aggregator drop point farther from TPA Jatibarang:

"When we do take fabric, we have to sort it by length. The short scraps go straight to the factories to be mixed into asbestos. The medium-to-long pieces we send off to be turned into floor mats and mops. The really long fabrics are the only ones that actually get picked up for recycled fashion. We are very picky about what

we take now. We only want pure cotton, that has the highest value. But polyester or those poly-cotton blends? They are completely worthless to us now. No one wants to buy them. Honestly, we are starting to turn people away when they bring in textiles. We accept very little to none these days. We will much rather deal with plastic waste, which (plastic) is just so much easier to move and sell, it is way easier to store, and the margins are much higher. Textiles just are not worth that much anymore."

This revealed market failure in the textile recycling supply chain. The current market dynamics that happening force them to only acquire waste specifically for the cotton fabric waste, and even then, it still does not sell that good. Polyester or mixed textile waste (poly-cotton) is rejected outright most of the time due to the lack of economic value and demand. The absence of clear technical instructions and regulations requiring corporations to subsidize polyester recycling has left the market operating at a standstill. Consequently, stopping textile acceptance entirely and shifting their commodity portfolios to plastic waste, has higher liquidity and sales value are better for these recycle waste materials aggregator, both for the field scavengers or the management of the material drop points.

Similar conditions can be seen in figure 4.4. whereas mostly plastic wastes are collected in the drop point. Although the two locations exhibited general differences in their overall business management, the findings regarding their handling of fabric waste were remarkably consistent.



Figure 4.4.

Waste aggregator drop point, near TPA Jatibarang.

The dysfunctionality in the waste collection sector based on the data heavily impacts waste management of the garment production sector, specifically among small and medium-sized enterprises (SMEs). The lack of oversight, communication, and support from the government agency stemming from the policy has led to the informal standard operating procedures mechanism, which vary from one another. The actions were representing a personal choice driven by economic sustainability and "what I think is good", rather than a form of obliging official laws or regulations, which dysconnectivity shown are true to the problem of Martin et. al.'s (2025) policy-practice gap concept.

4.3. The Implementations of Mayoral Regulation No. 4 of 2024

Six years after the 2018 implementations, the Semarang City Government implemented a drastic narrative shift with the enactment of Mayoral Regulation No. 4 of 2024 concerning the Semarang City Waste Management Masterplan. The issuance of this regulation serves as the city's waste management masterplan starting from 2024 which mainly represents an adaptation and substantial shift in waste management policy in Semarang City. This masterplan breaks down the

‘miscellaneous’ wastes on prior regulations into clearer category, which one of them is the existence of textile waste.

There were a lot of dump trucks on the day of observations. We observed those trucks and found that the garbage was also mixed. The only separated waste was plastic bottle and one-use gallons. The rest just dumped straight to the dumpster. Amongst the garbage mix, we found T-shirts, socks, sandals, and any other piece of clothing and sheets of fabrics (see figure 4.5.).

The emergence of the textile acknowledgement should not be interpreted as a sudden, anomalous explosion of waste in 2024. Rather, this condition represents an empirical manifestation of the accumulation of unmanaged waste due to undetailed regulatory vacuum throughout the 2018–2024 period. Referring to the theoretical framework of the Dual Challenge of Organizational Learning by Martin et al. (2025), the formulation of the 2024 Masterplan shows an emphasis on Adapting Policy to Practice.



Figure 4.5.

Dumptruck with mixed waste.

The overlooking of textile waste as a recyclable material, consequently, even though it is acknowledged in the regulation document, is still positioned as an institutionally and practically invisible waste. The Masterplan merely presented a macro target on paper, but again failed to provide rigid operational technical instructions, incentive schemes for the informal recycling sector, or supporting budget allocations for synthetic fabric processing technology. As a result, formal recognition in 2024 failed to address the root cause of market failure. Scavengers continues to overlook textile waste due to its lack of economic value and the absence of government subsidies. Further overlooking of textile waste is that it is not used as a source of energy. Citing from the regulation document, waste that can be collected and used includes glass, plastic film, HDPE, PET, paper, metal, electronics, and plastic bags, completely left out textile. This conditions omission is a form of active negligence that sets misplaced priorities amidst the massive growth of home industries and fashion trends in Semarang. This could be rendered in confusions to the public on how to treat their textile waste, which explains the textile wastes ended up in TPA Jatibarang untreated nor separated.

Although Mayoral Regulation No. 4 of 2024 was successful in terms of problem recognition, critical gap occurred. Without operational derivative policy instruments, this masterplan still possesses the risks of becoming trapped in mere administrative formality, while street-level actors are left to implement their own street standard operating procedures amidst the increasingly visible crisis. These conditions could be understood with Jason Martin's (2025) failure of mutual adaptation, which seeing policy-practice gaps as a failure of adapting ongoing practices to prescribed policies and/or to adapt policies to the complexities of ongoing practices.

The upstream recycling recovery process, in addition to scavengers, involves waste management (TPS3R) at 5.93 tons per unit per year, followed by waste collectors at 3.69 tons per person per year, waste disposal sites at 2.40 tons per unit per year, and waste banks at 2.06 tons per unit per year. Citing from Mayoral Regulation 2024 documents, there are 22 TPS3R (Reduce, Reuse, Recycle) waste management sites which revealed assesed performances and conditions. (See table 4.1.).

No	TPS3R	Status	Grade	Functionality
TPS3R Community-Managed				
1	TPS 3R Pedalangan Bersinar	Active	19,25	Very good
2	TPS 3R Ngaliyan	Inactive	5,75	Very Poor
3	TPS 3R Gondoriyo	Inactive	5,15	Very Poor
4	TPS 3R Resik Mandiri	Inactive	8,75	Very Poor
5	TPS 3R Kaligawe	Inactive	9,35	Very Poor
6	TPS 3R Sendangmulyo	Inactive	5,15	Very Poor
7	TPS 3R Jatisari	Inactive	5,15	Very Poor
8	TPS 3R Muktiharjo Kidul	Inactive	6,95	Very Poor
9	TPS 3R Ngudi Lestari Ngesrep	Inactive	6,95	Very Poor
10	TPS 3R Jabungan	Inactive	6,95	Very Poor
11	TPS 3R Palebon	Inactive	6,75	Very Poor
12	TPS 3R Penggaron Kidul	Half-active	11,75	Poor
13	TPS 3R Mangkang Kulon	Half-active	11,85	Poor
14	TPS 3R Ngudi Kamulyan Sampangan	Half-active	6,95	Very Poor
15	TPS 3R Dadi Resik	Half-active	13,55	Poor
16	TPS 3R Purwosari	Half-active	6,35	Very Poor
TPS3R Private-Managed				
17	TPST BSB	Active	19,95	Very good
18	TPST Unnes	Active	20,35	Very good
19	TPS 3R Undip	Active	15,75	Good
20	TPS 3R Tembalang	Inactive	8,75	Poor
21	TPST Gemah	Active	18,25	Good
22	Rumah Kompos UPTD Wilayah II	Active	16,55	Good

Tabel 4.1.

TPS 3R Assessment. (Source: Mayoral Regulation No. 4 of 2024).

Among the sixteen community-managed facilities assessed, operational deterioration was nearly universal. Within this failing group, twelve facilities were classified as “Very Poor” and three were rated as “Poor.” Only one community-managed site demonstrated optimal operational capacity, achieving a “Very Good” rating. These widespread operational deficiencies strongly suggest that grassroots community groups lack the necessary technicalities and institutional support to sustain complex waste management infrastructure over time. As cited from the regulation document, there are no incentives for upstream waste processing by the Semarang City Government. When we look at the failure rate, it means a major gap in the current strategy which is expecting local residents to maintain complex waste infrastructure without sustained funding and technical support does not work.

In contrast, the six privately managed facilities are rated significantly higher and more stable operational performance. Five of the six private sites managed to meet or exceed baseline operational standards, with two receiving a “Very Good” rating and three rated as “Good.” Only one private facility was categorized as “Poor,” and none were designated as “Very Poor.” When trying to understand the outcomes of these policies, it's hard to ignore these structural inequalities. The data strongly suggests that private sector access to specialized capital, clear logistics, and professional oversight makes a huge difference. This shows that community-led waste management programs will need the same serious systemic support that keeps the private sector afloat in order to be sustainable.

Hence, the issuance of the 2024 Masterplan represents an effort to adapt policy to practice has failed based on the "Dual Challenge of Organizational Learning" perspective by Martil et.al. (2025). While the 2024 Masterplan is capable of articulating the problem narratively, it is still highly ineffective in reality from operational implementation. The policy remains unresolving as its predecessor and lacks the formulation for textile waste management, particularly for home-based industrial producers and the informal sector.

The data found were also confirms that waste managers working in upcycle workshop and garment workshops had absolutely no guidance or exposure to information regarding the existence or substance of the 2024 Masterplan. This

condition indicates that the policy were idealistic on a macro-level scale which narratively formulated within the bureaucracy only as it has not been effectively applied to the grassroots level. In this regard, the community could only relying to waste management they think the most rational, which of course would lead to different treatment from each household. Field observations confirm a lack of effort from the government to restore the functionality of either the informal recycling ecosystem or formal infrastructure. There has been no upgrade or change in sorting container capacity at temporary dumpsites and no textile specific sorting or any other sorting place.

Even the acknowledgement of textile waste has been written in the masterplan, the absence of guidelines to treat it has failed to guide or change the operational behavioral patterns left by previous policy ingrained over the past six years. Therefore, it is concluded that the 2024 Masterplan has yet to offer a definitive resolution to the operational and structural failures which still hindering the textile waste management in Semarang City.

CHAPTER V
CONCLUSSION

To achieve Nationally Determined Contribution with Presidential Decree, it could be seen that the most effort are on the grassroot actors which they have to deal with the actual issues on the field. The policy-practice gap in textile waste management in Semarang City during the 2018–2024 period was rooted in flaw in the regulatory design, not solely due to low public participation. Based on thematic data analysis, the "policy blindness" in Mayoral Regulation Number 79 of 2018 has disrupted the management system from upstream to downstream. The failure of organizational learning (developmental learning) within government institutions has triggered dysconnectivity. Structurally, the lack of a textile waste known as its own category blocks access to various supports such as supervisions, infrastructure funding, and technicalities as empirically evidenced by the facility deficit at the waste disposal site (TPS) level and the absence of specific processing instruments at the Jatibarang landfill.

For the informal economy, the absence of the government's intervention in the form of regulation, specifically in the pricing and market flow schemes has led to market failure as it fails to create demand for the textile waste. The recycling supply chain has stagnated when collection agents establish strict material classifications, acquiring only high-value cotton materials and rejecting synthetic waste such as polyester or poly-cotton blend. This market dysfunction forces grassroots producers, particularly garment SMEs, to formulate their own operational system through their own method of disposal such as burning and illegal dumping into rivers. The manifestation of all these systemic failures culminates in the accumulation of legacy waste which degrades and hardens permanently at the Jatibarang landfill.

Furthermore, the Mayoral Regulation No. 4 of 2024 has been found to be incapable of redressing this implementation gap as the issue of the textile waste persists. Although this strategic regulation represents an effort to adapt through recognition of the textile waste generated per day, this instrument remains passive.

The absence of technical guidelines, information asymmetry among informal actors who have not been exposed to socialization, and the lack of regulations enforcement confirm that the masterplan has not been success to address the issues of operational amongst the communities.

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APPENDIX

Field Data Collection Method

Time: The field data collection was conducted within February 2026

Place: Semarang, Central Java, Indonesia

A. Data Collection Matrix

Below is the matrix of the field data collection method and its expected outcomes:

Data Category	Data Type	Description
A. Street-Level Operations (SOP)	Primary Data (Interview & Observation)	The working patterns. Focus on finding: How they treat or discard textiles.
B. The Mechanisms	Primary Data (Interview)	Waste management practices. Focus on finding: ways of operational on textile waste disposal (e.g., burning waste, dumping into rivers, or any mistreated waste).
D. Physical Evidence	Primary Data (Visual Observation)	Visual Documentation (Photos/Videos) at TPA Jatibarang. Focus on finding: layers of old textile waste and piles fabrics that get buried in the older waste zone and real-time observation of textile waste volume landfill to validate the urgency cited in the 2024 Masterplan.

B. Interview Method

Method	Open Ended Interview
Respondent	4 Respondents
Main Question	The questions are specific to Perwali Semarang (Semarang's Mayoral Policy) for textile waste policy and will evolve around these following questions: Initial question: Do the source knows about the existence of Mayoral Regulation waste policy? If yes: 1. To what extend do they know the policy? 1. Do they act according to the policy? 2. How long they have been implementing it? 3. Are they aware of the policy change? 4. Is there any difference from time-to-time? 5. Is there any supervision, support, or evaluation from the government? If no: 1. How they dispose or treat the waste? 2. On what basis do they treat their waste? (Common sense, intuition, self-made standard, etc.) 3. Is there any support from the government? (Technical guide, penalize, or giving incentives) 4. What is the reason of lack of knowledge about the policy?
Duration	30-60 minutes per respondents

C. List of Respondents

No	Name	Status

1.	TPA Jatibarang Management	The management of the TPA Jatibarang as the final landfill managers.
2.	A Convection SME	Small and medium enterprise (UMKM) scale clothes producer (anonymous by their request). This source was selected as the business related to the research as a textile waste contributor.
3.	Craftonesia	Small and medium enterprise (UMKM) scale upcycling. This source was selected as the implementer of aspect reuse of the Jakstranas 3R movement.
5.	ATLR 203	Small and medium enterprise (UMKM) scale that produce and tailoring denim fashion product. This source was selected as the business related to the research as a textile waste contributor.
6.	Waste Aggregator/Pemulung	Waste scavenger that collects recyclable materials. This source was selected as one of the chain aspects of Jakstranas 3R movement as implementer of reuse and recycle aspect.

D. Observation Method

No	Site of Observation	Status
1.	TPA Jatibarang Management	Visual documentations (photo and video) of the conditions within and around the landfill to match data from interview with the management and real conditions on the field.
2.	A Convection SME	Visual documentations (photo) within the small and medium enterprise (UMKM) scale clothes producer (anonymous by their request) showing the business' way from production and its waste treatment.

3.	TPS 3R	Observe the actual condition of temporary disposal sites or TPS within the city. For this research, we observed three TPSs in three subdistricts: TPS Tembalang, TPS Sendangmulyo, and TPS Pedurungan Kidul
4.	Waste Aggregator/Pemulung Drop Point	Visual documentations (photo) of two waste aggregator drop points. One was close with the TPA Jatibarang, and the other drop point was far from the TPA Jatibarang.