

Supervisory Function in Controlling Single-Use Plastic Pollution in Makassar City

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ABSTRACT

This study analyzed the supervisory function of the Environmental Agency of Makassar City in controlling environmental pollution caused by single-use plastic waste. Using a qualitative descriptive method, the research explored four key dimensions of supervision based on Terry's control theory: standard setting, monitoring and evaluation, result comparison, and corrective actions. The findings showed that although the agency had a clear legal foundation through Mayor Regulation No. 21 of 2023 on the prohibition of plastic bags, operational standards and measurable performance indicators were not fully developed. Monitoring and evaluation were conducted only once a year, which limited the agency's ability to capture variations in business compliance. The study also revealed that several business entities continued to violate the regulation, as evidenced by the issuance of warning letters. This indicated that the targets of plastic reduction had not been optimally achieved. Corrective actions remained limited to administrative warnings without structured follow-up mechanisms or tiered sanctions, which reduced their deterrent effect. Overall, the supervision function had been initiated but was not yet effective in ensuring consistent compliance and reducing single-use plastic waste. Strengthening operational standards, increasing monitoring frequency, improving data-based evaluation, and enforcing tiered sanctions were required to enhance environmental protection efforts in Makassar City.

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1. Introduction

Environmental pollution caused by single-use plastic waste has become one of the most pressing environmental issues in urban areas, particularly in rapidly developing cities such as Makassar. The increasing volume of plastic waste—from retail activities, food and beverage services, and household consumption—has significantly contributed to environmental degradation, reduced ecological quality, and rising marine pollution. Data from the Environmental Agency of Makassar City recorded that in 2023 plastic waste accounted for approximately 16% of total waste production, reaching 169.85 tons daily. This condition highlights an urgent need for effective policy implementation and systematic supervision to control the environmental impacts of single-use plastics.

In response to these challenges, the Makassar City Government established Mayor Regulation No. 21 of 2023, which prohibits the distribution and use of single-use plastic bags across multiple commercial sectors. The effectiveness of this regulation, however, is inseparable from the supervisory function of the Environmental Agency—the institution mandated to monitor, evaluate, enforce compliance, and implement sanctions. Effective supervision requires the existence of clear operational standards, scheduled monitoring activities, measurable compliance indicators, and a structured corrective mechanism for non-compliant actors.

Several scholars have conducted studies on plastic waste management and environmental policy implementation in Indonesia, but the majority emphasize behavioral change, waste minimization programs, or technical policy outcomes. Research that specifically examines how environmental agencies conduct supervision remains very limited, especially at the local government scale. Moreover, studies that assess environmental supervision using an analytical governance model are still scarce. Therefore, this study integrates Terry's Control Theory (1972) as the primary analytical framework. Terry identifies four core supervisory elements—standard setting, monitoring and evaluation, result comparison, and corrective action—which enable an assessment of whether an institution's control system operates effectively.

This theory is highly relevant to the present research because the enforcement of single-use plastic policies requires measurable standards, continuous monitoring, performance-gap evaluation, and structured corrective responses—mechanisms that directly correspond to the four dimensions of Terry's framework. By aligning policy implementation with this theoretical model, the study is able to evaluate not only the presence of regulations but also how well these regulations are executed and enforced in practice. Thus, Terry's theory provides a systematic lens to assess the strengths, weaknesses, and performance gaps within the Environmental Agency's supervisory function.

This study employs a qualitative descriptive method to examine how the Environmental Agency of Makassar City conducts supervision over the implementation of the plastic bag prohibition policy. Data were collected through interviews, document analysis, and field observations. The research aims to (1) identify the standards and legal frameworks guiding supervision, (2) analyze the execution of monitoring and evaluation, (3) examine how result comparison is used to measure compliance, and (4) explore corrective actions imposed in response to violations.

The novelty of this study lies in its analytical positioning, where Terry's Control Theory is applied as a holistic evaluative tool to assess environmental supervision at the municipal level. Through this theoretical integration, the research contributes empirical insight into the operational challenges of supervising plastic reduction policies in urban settings and offers practical policy recommendations to strengthen environmental governance in Makassar City.

2. Methodology

This study employs a descriptive qualitative approach to examine the supervisory function of the Environmental Agency of Makassar City in controlling environmental pollution caused by single-use plastic use. This approach was selected because it allows an in-depth exploration of processes, mechanisms, and experiences of key actors involved in the implementation of plastic reduction policies.

Data were collected through two primary techniques, namely in-depth interviews and document analysis. In-depth interviews were conducted with informants who are directly involved in supervisory activities, including structural officials, supervisory staff, and other relevant stakeholders. Document analysis included Standard Operating Procedures (SOP), assignment letters, inspection reports, supervisory reports, and warning letters, all of which served as verification materials and supporting evidence for the data.

Data analysis followed the Miles and Huberman framework consisting of data reduction, data display, and conclusion drawing. Data reduction was conducted by selecting relevant information related to the supervisory function. The reduced data were then organized into thematic categories corresponding to the study indicators. The final stage involved drawing and verifying conclusions based on recurring patterns identified during analysis.

Data validity was ensured through two types of triangulation, namely source triangulation and technique triangulation. Triangulation was carried out by comparing findings obtained from interviews, documents, and observations. This process ensured that the data collected were accurate, credible, and scientifically accountable.

3. Result and Discussion

3.1 Standard Setting in Supervisory Activities

The establishment of standards represents the first component in George R. Terry's (1972) control theory, which emphasizes that supervision must be based on clear operational guidelines that function as a reference for evaluating performance and directing corrective measures. In this context, the supervision of single-use plastic policies in Makassar City is grounded in a multilayered regulatory framework consisting of Law No. 18/2008, Government Regulation No. 81/2012, Presidential Regulation No. 97/2017, and Ministerial Regulation P.75/2019, which collectively mandate waste reduction, 3R practices, producer responsibility, and restriction of disposable plastic circulation. At the regional level, supervision is implemented under Makassar Mayor Regulation No. 21/2023, Article 15, which grants authority to the regional government to conduct guidance, monitoring, supervision, and evaluation of plastic usage among business actors.

Table 1. SOP Structure for Plastic Bag Supervision in Makassar City

SOP Phase	Standard Components	Code
Preparation Stage	Supervision schedule planning	I.A.1
	Assignment letter, accompaniment letter, notification letter, coordination	I.A.2
	General business data collection	I.A.3.b
	Inspection tools and materials checklist	I.A.5.a
Field Implementation Stage	Full inspection report (BAP) documentation	I.B.2 – I.B.18.a
	Field photo documentation	I.B.15
	Visual layout/sketch of inspection area	I.B.16
Reporting and Follow-Up Stage	Supervision report compilation	I.C.1.b
	Follow-up notice for non-compliance	I.C.2
	Administrative sanction issuance	I.C.4.b
	Attendance record of inspection activities	–

The SOP demonstrates that the supervision process is formalized through a complete operational framework involving preparation, inspection, reporting, and enforcement. The application of this standard is validated through field testimony obtained from interviews with supervisory officials. As stated by Ms. K, staff member of the Environmental Agency of Makassar City:

“All stages in the SOP are carried out systematically and serve as a mandatory guideline for supervisory officers. Effective supervision is not only measured by the number of violations found, but by the extent to which the results are accepted by business actors and followed by behavioral change. The ideal form of supervision in practice is not one that merely highlights violations, but one that is well-received by the regulated parties. Thus, supervision outcomes should not end at administrative sanctions alone, but should lead to improvement in compliance and reduced plastic bag usage. This approach is considered more effective in fostering environmental awareness and strengthens collaborative relations between the government and business sectors in reducing single-use plastic consumption.”

(Interview with Ms.K, Environmental Agency of Makassar City, 2025)

This evidence indicates that supervisory standards are not only documented administratively but function as the main operational guide in field execution. However, the current SOP remains highly procedural and has not yet incorporated quantitative compliance indicators that measure behavioral change or reduction outcomes. Referring to Terry’s theoretical structure, supervisory standards in Makassar can be categorized as established and applicable, but require measurable performance indicators to strengthen accountability and long-term policy impact.

3.2. Monitoring and Evaluation

The monitoring and evaluation stage is an essential component of the supervisory function as stated in George R. Terry’s control framework, which emphasizes that supervision does not end at standard setting, but must be followed by systematic monitoring to assess whether policy implementation aligns with predetermined objectives. In the implementation of Makassar Mayor Regulation No. 21 of 2023 on the Prohibition of Single-Use Plastic Bags, the Environmental Agency of Makassar City carries out monitoring and evaluation as a mechanism to ensure policy continuity, compliance among business actors, and the effectiveness of government intervention.

3.2.1 Monitoring of Policy Implementation

Interviews with Ms. A, Policy Analysis Staff, reveal that monitoring is conducted annually through two main mechanisms:

1. Direct monitoring

On-site inspections of business actors to observe the level of compliance.

2. Indirect monitoring

Through workshops, dissemination activities, and community-based reporting mechanisms.

This is supported by field testimony:

“Monitoring is carried out annually and adjusted to the availability of human resources and budget capacity. We conduct direct inspections by visiting business sites to observe their compliance with the plastic bag prohibition. Meanwhile, indirect monitoring is conducted through workshops, socialization activities, and public reporting channels to capture violations in the field. Through these two approaches, we ensure that the policy is implemented not only administratively but also operationally in practice.”(Interview, 24 October 2025)

Direct monitoring primarily focuses on three business sectors:

Table 2. Monitored Business Sectors and Observation Focus

Monitored Sector	Monitoring Focus
Modern Retail	Supermarkets, minimarkets, shopping centers
Restaurants & Food Outlets	Dine-in and takeaway operations
Food & Beverage (F&B)	Cafés, bakeries, coffee shops

In addition to field inspections, monitoring is reinforced through evaluative workshops:

“Besides field inspections, we conduct monitoring through evaluative workshops inviting business actors to report progress, discuss challenges, and design collaborative solutions.”(Interview, 24 October 2025)

Stakeholder collaboration strengthens monitoring coverage:

Table 3. Stakeholder Participation in Monitoring Activities

Partner Institution	Role in Monitoring
PKK & Waste Bank Units	Community education and compliance support
Adiwiyata Schools	Environmental awareness campaigns
Private Sector (CSR)	Provision of eco-friendly waste facilities

“We do not work alone in monitoring activities. We collaborate with PKK, Waste Bank Units, and Adiwiyata schools to help educate the community and oversee business compliance. Private sectors are also involved through CSR programs that support the provision of segregated bins and eco-friendly packaging alternatives.”(Interview, 24 October 2025)

3.2.2 Evaluation of Compliance

Monitoring focuses on four evaluation indicators:

1. compliance level of business actors,
2. public participation in reducing plastic use,
3. availability of eco-friendly packaging alternatives,
4. reduction of plastic waste generation.

The monitoring results for 2024 show:

Table 4. Compliance Level of Business Actors in 2024

Compliance Status (2024)	Number of Businesses	Percentage
Compliant	29	72.5%
Non-compliant	11	27.5%
Total Inspected	40	100%

Compliance was highest in the restaurant sector (80%) and lowest in F&B (50%). This is influenced by cost readiness and access to eco-friendly alternatives. As noted by the interviewee:

“Compliance levels vary. Modern retail and restaurants are generally more prepared, while smaller businesses such as cafés or bakeries still struggle with cost and availability of eco-friendly packaging. This requires a different mentoring strategy so that the policy can be applied evenly across sectors.”

(Interview, 24 October 2025)

Compared to 2023, compliance increased by 10%, indicating early success in behavioral change among business actors and the community.

3.2.3 Follow-Up of Monitoring Outcomes

Businesses found to still be using plastic bags receive a **written warning** as the initial administrative sanction in accordance with Article 17 of Mayor Regulation 21/2023:

“Any business still found using plastic bags will be issued a written warning as an initial sanction. We usually provide a correction period before conducting a re-inspection.”

(Interview, 24 October 2025)

Evaluation reports are prepared annually and submitted to the Environmental Agency leadership and the Audit Board (BPK). Results are also published via official digital media to maintain transparency and encourage public participation. A digital reporting platform—**Lontara+**—is provided for citizens to submit violation reports.

“We compile annual monitoring reports and submit them to BPK and the agency leadership. We also publish evaluation results through official government platforms so that the public can monitor implementation. The digital reporting system Lontara+ also enables citizens to report violations quickly and directly to us.” (Interview, 24 October 2025)

3.3 Result Comparison

Result comparison is the third stage of the supervisory function according to George R. Terry, which consists of evaluating implementation performance by comparing *planned or standard performance* and *actual field performance*. This stage becomes a key indicator of the success of the plastic bag ban policy implementation as well as the basis for identifying performance gaps and their contributing factors.

Based on the 2024 supervision report, the Environmental Agency of Makassar City set a target of supervising 30 business entities. However, the realization exceeded the plan, reaching 40 supervised business entities or 133% of the target. This indicates administrative success, as the monitoring execution surpassed its initial target.

Table 5. Comparison of Planned Target and Monitoring Realization (2024)

Indicator	Target	Realization	Percentage
Supervised business entities	30	40	133%

Despite exceeding the administrative target, substantive compliance has not yet reached an optimal level. From the 40 businesses monitored, only 29 (72.5%) had stopped providing single-use plastic bags and shifted to environmentally friendly packaging. Meanwhile, 11 businesses (27.5%) were still found distributing conventional plastic bags. This shows that the achievement in monitoring coverage has not been directly proportional to behavioral compliance.

Table 6. Business Compliance Status in 2024

Compliance Category	Number of Businesses	Percentage
Compliant	29	72.5%
Non-compliant	11	27.5%
Total	40	100%

Aggregate monitoring data also shows a wider gap. Out of 129 registered business entities included in the supervisory database, only 57.36% had implemented the regulation, while 42.64% continued to use plastic bags. This indicates that nearly half of the regulated actors have not yet adapted to the policy, suggesting notable constraints in achieving widespread compliance.

As a corrective measure, the Environmental Agency issued 11 written warning letters to non-compliant business entities. These letters were issued in two periods—30 October 2024 and 11 November 2024—with a seven-day deadline for policy correction.

Table 7. Business Entities Receiving Written Warnings (2024)

No.	Business Sector	Letter Number	Date	Follow-up
1–7	Retail	008/660.4/8373–8380/DLH/X/2024	30 Oct 2024	7-day correction
8–9	Food & Beverage	008/660.4/8387–8388/DLH/X/2024	30 Oct 2024	7-day correction
10	Retail	008/660.4/8737/DLH/XI/2024	11 Nov 2024	7-day correction
11	Restaurant	008/660.4/8738/DLH/XI/2024	11 Nov 2024	7-day correction

The issuance of warning letters confirms that supervisory actions have been implemented procedurally; however, it simultaneously reflects that substantive behavioral compliance has not been fully achieved. This condition is supported by the interview statement:

“We continue to improve monitoring effectiveness through outreach and education. However, human resource and budget limitations remain major barriers, so monitoring cannot yet be carried out comprehensively.” (*Interview, October 24, 2025*)

This suggests that internal factors such as human resources and budget constraints, along with external factors such as low awareness among small businesses, contribute to the persistence of non-compliance.

Based on the comparison between the supervision targets and actual monitoring results, the implementation of the plastic bag prohibition policy in Makassar City demonstrates administrative success, as indicated by the achievement of 133 percent of the planned monitoring coverage. However, this achievement has not been directly proportional to substantive compliance outcomes. Business adherence reached 72.5 percent, while 27.5 percent of monitored business entities remained non-compliant. Aggregate data also reinforce this condition, showing that nearly half of business actors across the city still continue to use single-use plastic bags.

The issuance of written warnings represents an initial corrective measure, yet its impact has not been sufficient to generate uniform behavioral change among business entities. Thus, while supervisory procedures have been executed in accordance with regulatory mechanisms, the level of compliance has not yet reached an optimal standard. Strengthening policy implementation, increasing resource and budget capacity, and enforcing sanctions more consistently are necessary steps to ensure higher compliance and the long-term success of plastic reduction efforts.

3.4 Corrective Actions

Corrective action constitutes the subsequent stage of supervision conducted by the Environmental Agency of Makassar City in enforcing Mayor Regulation No. 21 of 2023 concerning the prohibition of single-use plastic bags. This measure aims to ensure business compliance with legal provisions and strengthen the effectiveness of plastic waste reduction policies at the local level. Monitoring and evaluation results from 2024 identified eleven business entities—

primarily in the retail and food and beverage sectors—that continued to distribute single-use plastic bags. To address these findings, the Environmental Agency issued written warnings as an initial administrative sanction intended to stimulate behavioral adjustment and compliance improvement.

This corrective measure is grounded in Article 16 of Mayor Regulation No. 21 of 2023, which explicitly prohibits the provision and distribution of single-use plastic bags by businesses. Following field evaluations, the Environmental Agency issued Written Warning Letters No. 008/660.4/8373/DLH/X/2024 to No. 008/660.4/8738/DLH/XI/2024 dated 30 October and 11 November 2024. Each warned business entity was granted a seven-day compliance period to cease plastic bag distribution. Copies of the letters were forwarded to the Mayor of Makassar and the Civil Service Police Unit (Satpol PP) to reinforce institutional coordination in law enforcement.

Interview data from Mrs. H, Operational Service Administrator at the Environmental Agency of Makassar City, indicates that sanctions are implemented in a gradual escalation model. She stated:

“In principle, we enforce sanctions in accordance with the Mayor Regulation that serves as the legal basis for this policy. Sanctions are imposed in stages, beginning with verbal warnings as an initial guidance approach, followed by written warnings when violations are still found in the field. If written warnings are ignored, further action may involve the application of government coercion as a firmer form of environmental law enforcement.”(*Interview, 24 October 2025*)

Mrs. H further explained that written warnings are prioritised as a persuasive measure to foster understanding of policy substance among business operators. However, she acknowledged that the impact of written warnings alone has not been fully effective, particularly for small-scale businesses. As she stated:

“In practice, written sanctions have not yet produced a significant effect, especially among small businesses. Some did not follow up on the warning with concrete action. After some time, we also observed an increase in plastic bag usage in several locations, indicating that compliance remains inconsistent.”(*Interview, 24 October 2025*)

This indicates that corrective measures via written warnings face limitations in influencing behavioural change, especially among smaller business actors with varying levels of environmental awareness and resource capacity.

To strengthen enforcement, Mrs. H highlighted the need for more assertive follow-up actions:

“The latest evaluation suggests the need for stronger enforcement. Therefore, we recommend involving Satpol PP in the next stage to support government coercion. At this stage, Satpol PP could take direct action, such as seizing or removing plastic bags still provided by business actors as evidence of violation.”(*Interview, 24 October 2025*)

The involvement of Satpol PP is expected to increase deterrence and enhance enforcement power for persistent violations. Additionally, Mrs. H conveyed future policy development by integrating compliance with the plastic ban into the Online Single Submission (OSS) business licensing system:

“We are working to ensure that compliance with the plastic bag ban becomes a requirement within the OSS licensing process. This means that businesses applying for new permits or renewals will be required to sign a commitment to the ban. Regular compliance reporting will also be instituted to ensure continued monitoring.”(*Interview, 24 October 2025*)

This policy direction represents a structural effort to embed environmental responsibility into business administration, aligning regulatory and procedural mechanisms.

Administratively, the written warning letters issued by the Environmental Agency function as formal legal instruments in corrective enforcement. They specify the violation, outline the legal basis, set compliance deadlines, and demonstrate inter-agency coordination through official carbon copies. Thus, warning letters serve not only as procedural sanctions but as documented evidence of environmental law enforcement at the municipal level.

Overall, corrective actions undertaken by the Environmental Agency of Makassar City reflect a governmental commitment to strengthening plastic waste reduction policy implementation. Although effectiveness remains limited, especially among small businesses, the planned integration of OSS-based compliance and involvement of Satpol PP represents a strategic institutional advancement. With firmer, coordinated, and sustained enforcement mechanisms,

corrective actions hold significant potential to drive behavioural change and foster full compliance with the plastic bag prohibition policy in Makassar City.

4. Conclusion

Based on the findings of this study regarding the supervisory function of the Environmental Agency of Makassar City in implementing Mayor Regulation No. 21 of 2023 on the prohibition of single-use plastic bags, it can be concluded that the enforcement process has been initiated and structurally established, yet it has not reached full substantive effectiveness. The regulatory foundation and procedural standards have been well developed through national to local legal frameworks, supported by a formal Standard Operating Procedure (SOP) that outlines technical supervision stages. This indicates that administrative supervision has a clear and solid foundation.

The monitoring and evaluation process has also been implemented through annual inspections using both direct and indirect approaches, such as field observation, workshop-based evaluation, public reporting channels, and cross-sectoral collaboration. Administratively, the supervision achievement was recorded as successful, reaching 133% of the target. However, this accomplishment did not fully translate into behavioral compliance, as 27.5% of business actors remained non-compliant. This gap illustrates that high monitoring coverage has not yet been followed by equally strong behavioral adherence to the plastic ban.

The result comparison stage further reinforces the finding that implementation remains unstable, where aggregate supervision data indicate that nearly half of registered businesses have not yet complied with the regulation. This shows that policy effectiveness has not been achieved evenly across the business sector. Corrective actions have been executed through written warning sanctions, yet their impact remains limited and has not consistently driven widespread behavioral change. Stronger deterrence mechanisms, including the involvement of the Civil Service Police Unit (Satpol PP) and integration of compliance indicators into the OSS licensing system, are required to enhance enforcement outcomes.

Overall, this research concludes that the supervision of the plastic bag prohibition policy has been structurally adequate but substantively weak in shaping compliance. Future implementation requires more intensive monitoring, data-driven evaluation, and consistent tiered sanctions alongside capacity strengthening and continuous guidance targeted especially at small-scale businesses. Therefore, the success of plastic reduction policy depends not only on the existence of a regulatory framework but also on the capability of the supervisory system to transform behavioral patterns sustainably, ensuring significant reduction of plastic waste in Makassar City.

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