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Strategies for Improving Waste Management in Solok Regency

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ABSTRAK

Pengelolaan sampah di Kabupaten Solok masih menghadapi kesenjangan antara ketersediaan infrastruktur dan meningkatnya timbulan sampah yang belum tertangani optimal. Penelitian ini bertujuan merumuskan strategi kebijakan yang dapat meningkatkan efektivitas sistem pengelolaan sampah di Kabupaten Solok. Metode yang digunakan meliputi analisis deskriptif untuk menggambarkan kondisi eksisting, analisis SWOT untuk mengidentifikasi faktor internal dan eksternal, serta analisis regulasi untuk menilai efektivitas kebijakan nasional dan daerah. Hasil penelitian menunjukkan bahwa permasalahan utama terletak pada keterbatasan sarana prasarana, rendahnya partisipasi masyarakat, dan minimnya pendanaan. Namun demikian, terdapat peluang berupa dukungan regulasi nasional, potensi kerjasama dengan sektor swasta dan LSM, serta ketersediaan lahan untuk fasilitas pengolahan. Kesimpulan penelitian ini menegaskan bahwa perubahan paradigma masyarakat yang didukung penguatan regulasi, pembangunan infrastruktur TPS3R, serta kolaborasi multipihak merupakan kunci menuju sistem pengelolaan sampah yang lebih berkelanjutan di Kabupaten Solok

Kata Kunci: Pengelolaan Sampah, Kabupaten Solok, Kebijakan Publik.

ABSTRACT

Waste management in Solok Regency remains constrained by limited infrastructure, low community participation, and inadequate funding, resulting in a significant portion of waste being unmanaged. This research aims to formulate policy strategies to enhance waste management effectiveness by employing descriptive analysis, SWOT analysis, and regulatory review. The results indicate that, while challenges persist, opportunities exist through supportive national regulations, potential collaboration with private and non-governmental actors, and the availability of land for processing facilities. The research concludes that strengthening local regulatory enforcement, expanding TPS3R facilities, and promoting multi-stakeholder and community-based participation are critical to achieving a more sustainable waste management system in Solok Regency.

Keywords: Waste Management, Solok Regency, Public Policy.

Introduction

Waste management in Indonesia remains a strategic challenge for sustainable development. Although national regulations such as Law No. 18 of 2008 and Government Regulation No. 81 of 2012 have been issued, their implementation at the regional level remains weak (Iskandar & Rahman, 2019). Key obstacles include inadequate waste management

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infrastructure, low community participation, and weak institutional coordination (Setiadi & Trihadiningrum, 2020; Sari et al., 2022).

Solok Regency covers an area of 373,800 hectares and has a population of 410,430 people across 14 sub-districts and 74 Nagari (Solok Regency RPJMD 2025–2029). The population continues to grow by around 2,500 people annually, or approximately 0.75%. This growth contributes to increased daily waste generation, while improvements in waste management facilities and infrastructure fail to accommodate.

Table 1. Waste Generation in Solok Regency 2020-2024

Year	Waste Generation
2020	285.19 tons/day
2021	435.00 tons/day
2022	441.68 tons/day
2023	448.46 tons/day
2024	455.36 tons/day

Source: National Waste Management Information System (SIPSN), 2025

Table 1 shows that annual waste generation has increased from 285.19 tons per day in 2020 to 455.36 tons per day in 2024, yet the availability of management facilities has not grown accordingly (SIPSN, 2025). The low level of waste sorting at the source further reduces system effectiveness (Simanjuntak et al., 2021). This is influenced by a culture of littering and limited public awareness of proper waste management.

In line with demographic growth and prevailing community behavior, most areas in Solok Regency still rely on a collect–transport–dispose approach, similar to many other regions in Indonesia. This condition is reflected in the Solok Regency waste management balance presented in Table 2.

Table 2. Waste Managemetn Balance of Solok Regency 2020-2024

No	Variable	Year				
		2020	2021	2022	2023	2024
1	Percentage of managed waste	0	14.49	23.03	24.58	26.89
2	Percentage of unmanaged waste	100	85.51	76.97	75.42	73.11

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Source: National Waste Management Information System (SIPSN), 2025

Based on the 2024 waste management balance, unmanaged waste accounts for 73.11 percent, while only 26.89 percent is managed. This indicates that waste management requires serious attention from the Solok Regency Government. Waste is still commonly perceived as a worthless residual material. Meanwhile, population growth and increasing consumerism continue to raise the volume of waste that must be handled.

The limited transfer of waste management technology, low awareness of proper waste practices, and constrained funding further hinder effective management. Therefore, a comprehensive policy strategy is needed to improve waste management in Solok Regency.

Research Method

This qualitative descriptive research integrated three analytical methods: descriptive analysis, SWOT analysis, and regulatory analysis. The descriptive analysis described the actual condition of waste management in Solok Regency, including waste generation, the availability of facilities such as TPS3R and transportation vehicles, and the level of community participation. The SWOT analysis identified internal strengths and weaknesses as well as external opportunities and threats that influenced the performance of the management system. The regulatory analysis evaluated the alignment and effectiveness of regional policy implementation with national regulations, including Law No. 18 of 2008 and Government Regulation No. 81 of 2012.

Data were obtained through a review of official documents. The analysis was carried out in stages by mapping existing conditions, identifying strategic internal and external factors using the SWOT approach (Rangkuti, 2019), and assessing policy effectiveness using a public policy analysis framework (Dunn, 2018).

The results of these three analyses were then synthesized to formulate policy strategies for improving sustainable waste management in Solok Regency. The main focus was directed toward strengthening institutional capacity, revitalizing TPS3R facilities, increasing community participation, and optimizing regional policy implementation to support waste reduction at the source and sustainable development goals.

Results and Discussion

A. The Current Waste Management

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The amount of waste processed at waste management facilities in Solok Regency has increased, but it remains relatively low compared to total waste generation. As shown in Figure 1, processing rates rose from 7.4% in 2020 to 10.28% in 2024 (Waste Management Unit, West Sumatra Provincial Environmental Agency, 2025).

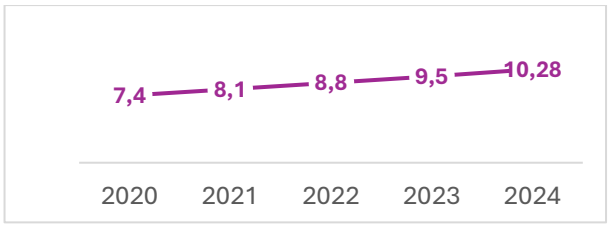

Figure 1. Processed Waste Generation at the Solok Regency Processing Facility (2020–2024).

Sumber : UPT Persampahan DLH Provinsi Sumatera Barat, 2025.

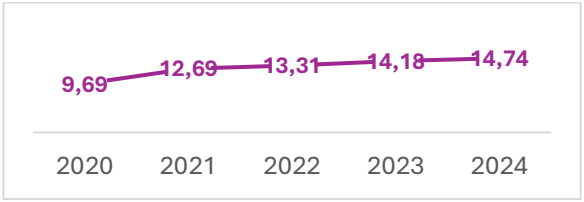

Figure 2. Proportion of Households with Waste Collection Services (%) (2020–2024)

Sumber : UPT Persampahan DLH Provinsi Sumatera Barat, 2025.

Despite this upward trend, the processed portion is still minimal when compared to the total waste generation of 455.36 tons per day in 2024, indicating that most waste remains unmanaged and continues to pose environmental risks.

A similar positive trend is evident in household waste collection services. The proportion of households receiving full collection services increased from 9.69% in 2020 to 14.74% in 2024 (Figure 2). However, this coverage remains significantly below the national target, which mandates a minimum of 30% waste reduction and 70% waste treatment by 2025 (KLHK, 2018). This gap highlights substantial challenges faced by Solok Regency in meeting national waste management goals.

These conditions demonstrate a transitional stage in the local waste management system. While improvements in service coverage and facility operations are evident, they are not keeping pace with the increasing volume of waste generated. From a systems theory perspective, effective

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waste management requires coordinated functioning among government institutions, communities, and private actors (Bertalanffy, 1968). In Solok Regency, low community participation, particularly in household-level waste sorting (15% in 2025) remains a critical limiting factor (Simanjuntak et al., 2021).

Likewise, Firmansyah et al. (2023) mphasize the role of simple technological innovations, such as maggot-based composting in addressing capacity constraints within waste processing facilities. Overall, waste management in Solok Regency shows incremental progress but has not yet achieved substantial impact. Strengthening public participation and integrating scalable local innovations are key to advancing toward national waste management targets.

B. SWOT Analysis

To develop an effective policy strategy, a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is necessary to assess the internal and external factors influencing waste management in Solok Regency. This analysis serves as a basis for identifying both the potential assets that can be leveraged and the constraints that require mitigation.

Table 2. SWOT Analysis on the Waste Management in Solok Regency

Strengths 1. The presence of supporting regulations (regional regulations and national policies). 2. The involvement of several community groups (waste banks and environmental volunteer communities). 3. Availability of land with potential for integrated waste management.	Weaknesses 1. Limited infrastructure and facilities (TPS 3R sites and waste collection fleets). 2. Low levels of community participation. 3. Insufficient budget allocation and limited managerial human resources.
Opportunities 1. Availability of regulatory support (regional regulations and national policies). 2. Environmentally friendly waste management technologies. 3. Potential collaboration with the private sector and non-governmental organizations (NGOs).	Threats 1. Increasing waste volume in line with population growth. 2. Environmental pollution risks if waste remains unmanaged.

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The results indicate that, although substantial limitations exist, there are also notable opportunities for improvement. This is consistent with findings by Suryani et al. (2022) in Bandung, which highlight regulatory support and multi-stakeholder collaboration as key determinants of urban waste management success. Through a sustainable development approach, internal weaknesses such as limited processing facilities and low community participation can be addressed by promoting technological innovation and strengthening community empowerment. Meanwhile, external threats, including increasing waste volumes, can be reduced through preventive policies grounded in the 3R principles (Reduce, Reuse, Recycle).

Overall, the policy strategy for Solok Regency should focus on utilizing external opportunities, particularly regulatory frameworks and technological advancements, to overcome internal weaknesses. At the same time, it must enhance system resilience to long-term challenges, such as population growth and environmental pollution risks.

C. Strategy Implementation

The waste management in Solok Regency has started to improve through the implementation of key local government initiatives, including the Clean Solok Program. The program was initiated as a part of the Regent's 100-day work plan for the 2025–2029 term. This initiative has been supported by the formation of a village-level Waste Task Force, an increase in waste collection vehicles, and targeted cleaning of high-risk waste accumulation areas. These measures indicate a growing commitment to strengthening waste management from the upstream (household level) to downstream (processing and disposal stages).

In addition, the establishment of a Main Waste Bank and the designation of "Mothers of the Environment" as community facilitators aim to enhance public awareness and participation. By 2023, these efforts had resulted in the formation of 18 waste banks in schools and villages, along with eight maggot cultivation groups to process organic waste. Such innovations reflect the principles of sustainable development, which emphasize the integration of social, economic, and environmental dimensions in policy implementation (WCED, 1987).

Despite this progress, several challenges remain. Budget constraints have limited the construction of TPS3R waste management facilities to only six of the fourteen sub-districts. Additionally, coordination among government institutions and collaboration with private stakeholders remain insufficient. This condition aligns with Putri et al. (2023), who argue that local political dynamics frequently affect the consistency of environmental policy implementation.

Overall, while the waste management strategy in Solok Regency has shown initial progress through innovative programs, its implementation remains uneven and has yet to effectively reach

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all community levels. This gap highlights the need for stronger institutional coordination, sustained funding, and broader community involvement to ensure successful policy realization.

The evaluation of waste management strategies in Solok Regency up to 2024 remains limited, with assessments largely concentrated on technical indicators, such as the volume of waste transported to the Ampang Kualo regional landfill. Monitoring by the Environmental Agency (DLH) emphasizes service volume rather than evaluating the effectiveness of 3R-based initiatives. Consequently, the evaluation framework prioritizes quantity of waste transportation over the quality and outcomes of waste management practices.

The evaluation results show that, although the quantity of transported waste has increased, the proportion of waste actually processed remains relatively low (10.28% of total waste generation). This indicates that the strategy has not yet succeeded in significantly reducing waste at its source. Therefore, evaluation should include not only operational outputs but also changes in community behavior, levels of household waste sorting, and public satisfaction with waste management services.

In line with Wheelen and Hunger's strategic management framework, evaluation is essential to ensure alignment between strategy formulation and implementation. For Solok Regency, a more comprehensive approach could include three evaluation levels:

- Upstream evaluation: effectiveness of education programs and household participation in waste sorting.
- Midstream evaluation: operational performance of TPS3R facilities and the waste transport fleet.
- Downstream evaluation: environmental impacts of waste management, including reductions in pollution and unmanaged waste.

Sari et al. (2022) also emphasize the need for incorporating institutional performance and community participation indicators when assessing the success of regional waste management systems.

The findings of this research align with previous research on waste management in Indonesia. Regulatory support remains a key driver of policy implementation, as seen in Suryani et al. (2022). In Solok Regency, Regional Regulation No. 7 of 2018 provides strategic direction, although its implementation requires strengthening. The low level of household waste sorting (approximately 15% in 2025) is consistent with Simanjuntak et al. (2021), who emphasize environmental education as a determinant of behavioral change.

This research also supports Firmansyah et al. (2023), demonstrating that simple technological innovations, such as maggot-based organic waste processing, offer practical

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solutions in areas with limited infrastructure. However, unlike Rahmawati and Kurniawan (2020), who highlight successful public–private partnerships in urban contexts, private sector involvement in Solok Regency remains minimal. Furthermore, in line with Putri et al. (2023), political leadership influences program outcomes. The Clean Solok initiative and the appointment of "Mothers of the Environment" illustrate how leadership can strengthen waste management efforts, though sustainability remains uncertain.

Overall, this research reinforces the importance of integrating regulatory support, community participation, appropriate technology, and political commitment. Its contribution lies in demonstrating how these elements operate in a rural context, underscoring the need for adaptive policies grounded in local capacity and conditions.

Conclusion

The findings indicate that waste management in Solok Regency remains ineffective, with approximately 73% of waste unmanaged due to limited infrastructure, low community participation, and inadequate funding. The SWOT analysis shows that regulatory support and opportunities for multi-stakeholder collaboration constitute key strengths, while operational constraints and weak inter-agency coordination are major weaknesses. Although Regional Regulation No. 7 of 2018 provides a comprehensive normative framework, its implementation remains inconsistent across technical and institutional levels.

This research contributes to the broader understanding of waste management effectiveness in rural contexts, which has been less examined compared to urban settings. The findings reinforce the importance of integrating regulatory frameworks, community participation, and political support as determinants of successful waste management systems (Simanjuntak et al., 2021; Sari et al., 2022). The results also affirm the relevance of multi-level governance and community-based approaches as foundations for sustainable environmental policy. To improve waste management effectiveness in Solok Regency, these measures are recommended.

- Providing incentives for household and community waste sorting and recycling through fiscal and non-fiscal support.
- Strengthening public–private partnerships for TPS3R management and simple, locally appropriate organic waste processing technologies.
- Enhancing institutional capacity through staff training, integrated digital waste data systems, and cross-village service coordination.

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- Expanding community awareness and participation, supported by coordinated action across village, district, provincial, and national levels, including private sector engagement.

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