

The Role of the Environmental Agency in Waste Management: A Qualitative Study in West Aceh District

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ABSTRACT

Introduction: The rapid growth of population and economic activity has exacerbated waste management challenges in Indonesia, including in West Aceh Regency. The imbalance between waste generation and the capacity of existing management systems has led to waste accumulation in various locations, particularly in densely populated areas. This study aims to examine the role of the Environmental Agency (DLH) in addressing waste congestion and to identify the supporting and constraining factors that influence the implementation of waste management policies in West Aceh Regency. A qualitative descriptive design with a phenomenological approach was employed to gain an in-depth understanding of the experiences and perceptions of waste management stakeholders. Data were collected through in-depth interviews, field observations, and document review using purposive sampling, involving DLH officials, sanitation workers, and community members. Data analysis was conducted through iterative processes of reduction, presentation, and verification. The findings indicate that the West Aceh DLH plays a strategic role in waste management through the implementation of a controlled landfill system, community education on waste segregation, and strengthened cross-sectoral collaboration such as waste bank initiatives and communal clean-up activities. However, policy effectiveness remains constrained by limited facilities and infrastructure, insufficient human resources, and low community participation in fee payment and waste sorting practices. In conclusion, successful waste management in West Aceh requires greater synergy among institutional capacity, regulatory support, and community-based social awareness to ensure sustainable waste governance.

INTRODUCTION

As the population continues to grow and human activities become increasingly diverse, waste management has emerged as one of the most complex environmental challenges at the global level. The rising volume of waste not only contributes to environmental pollution but also accelerates ecosystem degradation and exacerbates climate change (1). Countries across Southeast Asia, including Indonesia, face similar challenges such as limited waste management infrastructure, weak regulatory enforcement, and low public awareness—conditions that underscore the importance of international collaboration in achieving sustainable solutions (2). According to data from the Ministry of Environment and Forestry (KLHK), Indonesia generated 41.07 million tons of waste in 2023. This figure declined significantly to 18.45 million tons in 2024. Nevertheless, waste management remains a serious issue, with only about 58.62%, equivalent to 10.81 million tons, being adequately managed. Meanwhile, the remaining 41.38%, or approximately 7.63 million tons, was not properly handled. The imbalance between waste volume and management capacity reflects persistent weaknesses in waste management infrastructure and systems in various regions, which may lead to adverse impacts on environmental quality and public health if not comprehensively addressed. This situation also highlights a gap between national policy directives and their actual implementation at the local level (3).

Waste-related problems are not only evident at the national level but are increasingly concerning at the provincial level, including in Aceh Province. Data from the Aceh Environmental and Forestry Agency (DLHK) show that the total waste generation in 2024 reached 940,267.22 tons per year. The largest proportion of this waste consisted of food waste, accounting for 30.98%. This high percentage of organic waste indicates the need for more targeted strategies focusing on household waste management, particularly efforts to promote waste segregation at the source. Without proper intervention, the recycling potential of organic waste will be lost, further burdening final disposal sites (TPA) (4).

A similar situation is also evident in West Aceh Regency, where rapid population growth and shifting consumption patterns have significantly contributed to the increase in waste volume. According to data from the West Aceh Environmental Agency, total waste generation in 2024 reached 37,432.21 tons per year. Most of this waste originated from household activities and traditional markets, with food waste comprising the largest proportion at 57%. This high percentage of organic waste clearly indicates that the household sector plays a central role in waste production; therefore, management strategies must prioritize community awareness, education on waste reduction at the source, and the promotion of household-level waste segregation (5).

Each resident in West Aceh Regency generates approximately 0.7–1 kg of waste per day. With an estimated population of \pm 207,690 people, the daily waste volume is projected to reach 102.55 m³/h (6). Unfortunately, the fluctuating waste volume, combined with modern lifestyle patterns and inadequate waste management infrastructure, has led many residents to dispose of waste in rivers, along roadsides, or by burning it. Low public awareness regarding waste segregation further aggravates the situation. Field observations indicate the presence of 27 illegal dumping sites across several subdistricts, with the largest concentration 17 points in Johan Pahlawan Subdistrict, particularly around markets, roadways, and residential areas. Meureubo Subdistrict has 8 sites, while Kaway XVI and Samatiga each have 1 site. These sites contribute to environmental pollution, produce foul odors, and disrupt community well-being. The minimal supervision at these locations highlights the suboptimal performance of West Aceh's waste management system.

The West Aceh Environmental Agency (DLHK) has made efforts to manage waste from collection to final disposal; however, its effectiveness remains limited due to insufficient fleet capacity, low community awareness, and the widespread practice of disposing waste on roadsides and into rivers. In fact, according to Law No. 18 of 2008 on Waste Management and Government Regulation No. 81 of 2012, waste management should be based on integrated reduction and handling. The gap between policy and actual implementation remains evident, as reflected in data from West Aceh DLH (2023), which recorded approximately 65 tons of waste per day that were not managed effectively (7). Under Qanun Aceh No. 4 of 2017 and Law No. 18 of 2008, local governments are mandated to implement the 4R principles (Reduce, Reuse, Recycle, Replacement) as the primary strategy for household waste management. However, its implementation in West Aceh Regency is still limited. According to West Aceh DLH data (2023), only 35% of households practice waste segregation far below the national target of 70% by 2025 as set by the Ministry of Environment and Forestry (2022). This gap reflects weak enforcement of community-based waste management policies as mandated by regulation (8). Although Law No. 18 of 2008 and Qanun No. 4 of 2017 emphasize the importance of household waste segregation, their implementation in West Aceh has not been optimal. West Aceh DLH data from 2023 show that most residents still mix organic and inorganic waste, even though household waste accounts for more than 60% of total national waste generation. Although public education efforts have been conducted, community participation and understanding remain low, indicating a gap between policy and practice (9).

Law No. 18 of 2008 mandates the government to ensure sustainable waste reduction and handling. However, implementation has been hindered by limited infrastructure, fleet capacity, and human resources, resulting in inefficient waste transportation and management (10). Cross-sector collaboration among government institutions, communities, and the private sector is therefore essential for achieving effective and efficient waste management in West Aceh Regency, as stated in Qanun No. 4 of 2017, which underscores the importance of stakeholder participation in supporting waste management policies (11).

Findings published in a 2020 study by Purnama Rizki DA HSB reveal that residents still do not segregate waste at home, creating problems due to inadequate facilities to manage accumulated waste in one location. The Gampong Jawa Final Disposal Site (TPA) has exceeded its capacity, its supporting infrastructure is damaged, and public awareness remains low. Therefore, it is crucial for DLHK3 to develop appropriate policies, not only relying on the Blang Bintang TPA to reduce the burden on the Gampong Jawa TPA, but also to provide additional waste treatment facilities.

Based on three target accuracy indicators public awareness, monitoring, and inadequate waste management facilities research conducted by Rike Martha Yulia in 2021 shows that the Environmental Agency of Aceh Besar Regency failed to implement effective waste management. Although various socialization efforts and training, especially for housewives, have been carried out, challenges persist due to low participation and limited public understanding that waste can hold economic value (12). This underscores that the effectiveness of waste management requires synergy between service providers, regulatory frameworks, and active community participation.

Given the conditions described above, waste accumulation in West Aceh Regency remains inadequately addressed. This is what prompted the researcher to investigate the topic "The Role of the Environmental Agency in Addressing Waste Accumulation in West Aceh Regency." The main objective of this study is to identify the supporting and inhibiting factors that influence waste management in West Aceh Regency, with a particular focus on the role of the Environmental Agency in addressing waste accumulation.

METHODS

This study employed a qualitative descriptive method with a phenomenological approach to gain an in-depth understanding of the role of the West Aceh Environmental Agency (DLH) in waste management (13). This approach was chosen because it enables researchers to explore the experiences, perceptions, and meanings articulated by informants who are directly involved in the waste management process (14). Data were collected through field observations, in-depth interviews, and documentation, using purposive sampling to select informants such as DLH employees, field workers, and community members. The analytical process involved continuous stages of data reduction, data presentation, and verification of findings. All procedures were conducted in accordance with research ethics principles, including informed consent and confidentiality of participant information. This study was conducted from October 2024 to 12 November 2024. The research site was the Office of the Environmental Agency (DLH) of West Aceh Regency, located on Jalan Lintas Barat Sumatra, Gampong Seunebok, Johan Pahlawan Subdistrict, West Aceh Regency, Aceh Province. A purposive sampling technique, based on predetermined criteria, was used to select informants for this study (15). The informants included the Head of the Environmental and Sanitation Agency of West Aceh, the Head of the Division for Sanitation and Environmental Conservation, the Head of the General Affairs and Program Subdivision, waste transportation officers, and community members residing in West Aceh Regency. Data for this study were collected from multiple sources, including interviews, documentation, and observational data. Additional supporting tools used in the data collection process included mobile devices, computers, paper, and writing instruments. To determine the environmental conditions affecting the region and the functional role of the Environmental Agency in West Aceh Regency, this study gathered data from interviews, observations, and document reviews.

RESULT AND DISCUSSION

RESULTS

Respondent Characteristics

Table 1. Respondent Characteristics

No	Informant role	Position	Code informant
1	Key Informant	Head of the Environmental Agency	KI.1
2	Key Informant	Head of Devision	KI.2
4	Key Informant	Head of the General Affairs Subdivision	KI.3
5	Main Informant	waste collection driver	MI.1
6	Supporting informant	Community	SI.1
7	Supporting informant	Community	SI.2
8	Supporting informant	Community	SI.3
9	Supporting informant	Community	SI.4

The Role of the Environmental Agency of West Aceh Regency

"DLH essentially manages waste comprehensively ... we collaborate with vertical and horizontal institutions as well as with the community ... DLH is no longer procuring trash bins ... every week we conduct communal clean-up activities ... waste segregation ... the waste bank has achieved around 60–70% ... we aim to increase it to 80–90%..." (KI.1).

"We are now focusing on reducing the amount of waste ... waste banks have been established in schools ... but the community is not implementing them ... the 3R waste management method is being applied ..." (KI.2)

"... We conduct socialization activities every year ... we prepare the JAKSTRADA ... it is quite challenging because we lack personnel ... our routine programs ... we have observed that about 80% has been implemented ... we are creating new innovations ..." (KI.3)

Based on the interview findings, the researcher concludes that the Environmental Agency plays a strategic role in comprehensive waste management through cross-sectoral collaboration. However, significant challenges remain, particularly in changing community behavior, as gaps persist between policy and actual implementation at the community level. In addition, limited human resources pose a major constraint in the execution of various waste management programs.

"... we use the controlled landfill method; all routes across West Aceh are served ... waste is collected every day ... the reason waste accumulates is the community itself, not the Environmental Agency." (KI.1)

"... we have 22 routes. Our fleet is complete: motor tricycles, L-300 trucks, and roll-off trucks for containers. Vehicle maintenance is carried out regularly ... for routes that are missed, the standby vehicle is immediately deployed." (KI.2)

"... the challenges include flat tires, vehicles being unable to operate ... DLH handles the maintenance directly ... another issue is that the community disposes of waste carelessly and does not separate it ..." (MI.1)

Based on the interview findings, the researcher concludes that the West Aceh Environmental Agency has implemented a controlled landfill system in its waste management efforts and ensures that all areas are adequately served. In addition, the operational management of waste transportation is supported by a relatively well-organized system that responds promptly to field-related obstacles. However, several technical challenges and community behavior issues continue to hinder the overall effectiveness of the program.

"The Sanitation and Environmental Control Division has 33 drivers, 65 assistants, 60 street sweepers, 6 cemetery workers, and 18 field staff. There are also 19 civil servants and 223 temporary staff for field and office work." (KI.1)

"The number of employees has decreased because some have retired or transferred. Currently, we are short of about 46 personnel ... the recruitment of Daily Temporary Workers (THL) is no longer being conducted, while several employees have passed the P3K exam and the number of civil servants has declined ... the budget is still allocated for 224 personnel, but we are still using the old organizational structure (SOTK) because the new Regent Regulation (PERBUP) has not yet been enacted." (KI.3)

Based on the interview findings, the researcher concludes that the human resource capacity within the West Aceh Environmental Agency plays a crucial role in the effectiveness of waste management. Field data indicate that the majority of personnel are non-civil servant workers (THL), who have limited contract duration and lower employment stability. This condition presents challenges in ensuring continuity and maintaining the quality of waste management services.

"The funding comes from the APBK (Regional Budget) ... there are slight variations each year ... so far, it has been sufficient." (KI.1)

"A large portion of the budget is allocated for fuel and maintenance ... many of the fleet vehicles require repairs ... there are no new procurements ... although the budget is limited, we still propose additional allocations as instructed by our leadership." (KI.3)

Based on the interview findings, the researcher concludes that the budget for the Environmental Agency (DLH) is sourced from the Regional Budget (APBK). Although DLH funding is relatively stable, it undergoes annual adjustments. The adequacy of the budget remains minimal, primarily covering routine needs such as operational activities and maintenance, with limited capacity to support innovation or the development of new facilities.

Facilities and Infrastructure of the Environmental Agency of West Aceh Regency

“We have 30 vehicles ... currently sufficient, including 6 four-wheel trucks and 6 Viar units. We do not have our own Temporary Waste Storage Sites (TPS); the villages are the ones that have them. There are five assisted villages ... containers have already been provided ... but the pickup vehicles are limited.” (KI.1)

“The fleet is still insufficient ... work equipment is not yet fully adequate ... all due to budget constraints ... we are not allowed to provide trash bins, in accordance with the 2019 regulation.” (KI.3)

Based on the interview findings, the researcher concludes that two major issues persist: the limited capacity of the fleet and budget constraints that restrict the procurement of new facilities. Although the Environmental Agency (DLH) has made efforts to maximize the use of existing resources, the gap between operational needs and available capacity remains a significant challenge. This situation is not solely a result of DLH's performance, but also reflects fiscal limitations and regulatory constraints that restrict the agency's technical functions. Therefore, cross-sectoral collaboration and strengthened capacity within the assisted villages are essential to ensure more equitable and sustainable waste management services.

Environmental Sanction Policies in West Aceh Regency

“We will apprehend individuals who dispose of waste illegally ... they will be fined three hundred thousand rupiah for each offense ... this applies to all community members without exception ... if someone violates the rules, they are issued a warning letter, depending on the type of violation committed ...” (KI.1)

“... for violations committed by employees, we issue a first warning letter (SP1), and if the offense is repeated, an SP2 is given, followed by an SP3 which results in immediate dismissal ... if they violate the regulations, they will be terminated; the rule applies to everyone.” (KI.2)

Based on the interview findings, the researcher concludes that the West Aceh Environmental Agency (DLH) implements law enforcement policies as part of its strategy to control illegal waste disposal. DLH carries out supervisory and regulatory enforcement functions through administrative sanctions and fines imposed on community members who violate waste management regulations. The agency is also committed to maintaining the integrity and discipline of its internal personnel, enforcing disciplinary measures on staff as a form of consistency and role-modeling in delivering public services. Together, these mechanisms serve as important instruments for strengthening equitable and integrity-based environmental governance.

“The community does not want to hand over their waste to the Environmental Agency ... they refuse to pay the retribution fee because they feel that twenty thousand rupiah is a loss ... as a result, waste accumulates and people dispose of it carelessly ... if residents are poor or underprivileged, they can obtain a letter from the village chief for one year of free service ... but many still refuse to pay, even though the retribution fee contributes to local revenue (PAD).” (KI.1)

“... retribution payments can now be made online; each household has been provided with a service sticker and an account number ... however, only about 25–30% are willing to pay online ... many elderly residents do not understand the system, so they still pay manually ... for those who cannot afford to pay, they can obtain a poverty certificate from the village, and their waste will still be collected without any charge.” (KI.2)

Based on the interview findings, the researcher concludes that issues related to public awareness and perceptions of the value of public services persist within the community. Such non-compliance contributes to increasing waste accumulation in the surrounding environment and reduces the potential for locally generated revenue (PAD) from the sanitation sector. Although digital payment mechanisms have been introduced, limited digital literacy and reluctance to contribute financially remain major factors hindering the effectiveness of the program.

Definition of Community Satisfaction in West Aceh Regency

“Sometimes the waste collectors arrive late ... sometimes the fee increases from twenty thousand to thirty thousand rupiah because they say the waste volume is too much ... there are also people who leave their waste with me because they do not have a trash bin ...” (SI.1)

“At the moment, we are not satisfied ... our waste can remain uncollected for three weeks to a month ... previously, it was collected twice a week ... now the payment is also inconsistent, sometimes they ask for forty to sixty thousand rupiah without any explanation.” (SI.2)

“... sometimes the trash bin is not returned ... if it gets damaged, it is not replaced ... now we pay forty thousand rupiah per month ... it is acceptable, but the service is sometimes lacking ...” (SI.3)

“The service is slow now ... previously, collection was three times a week, now only once ... the retribution fee used to be ten thousand, now it is twenty thousand ... many people disagree because they consider it too expensive ... if we pay late, the waste is not collected ... we are not satisfied.” (SI.4)

Based on the interview findings, the researcher concludes that the level of public satisfaction with waste management services remains low. Most informants expressed concerns regarding delays in waste collection, inconsistencies in the retribution system, and the lack of responsiveness among waste collection personnel.

“Supporting and Inhibiting Factors of the West Aceh Environmental Agency”

“The recycling program through the GPL waste bank has been supervised by the Environmental Agency (DLH) since early 2022. We collaborate with vertical and horizontal institutions as well as with the community. Monitoring is carried out 24 hours a day using patrol vehicles ... there are also green space (RTH) greening activities and weekly communal clean-up events.” (KI.1)

“In the JAKSTRADA program, there are annual training sessions for the fleet operators, street sweepers, and field coordinators ... GPL is now also supported by the MIFA company in recycling activities and works in collaboration with the Environmental Agency.” (KI.2)

Based on the interview findings, the researcher concludes that the West Aceh Environmental Agency demonstrates a strong commitment to improving the effectiveness of waste management through recycling programs and cross-sectoral partnerships. Thus, DLH serves not only as a technical executor but also as a facilitator and connector among various stakeholders.

“People are still not aware of cleanliness ... many do not want to hand over their waste to the collectors and prefer to throw it into rivers and drains ... conditions like this hinder our efforts to achieve an optimal level of cleanliness ...” (KI.1)

“... our limitations lie in the facilities; there should be three trash bins, but we only have one. Socialization has been carried out through banners and village leaders, but many residents still dispose of waste carelessly ... the 3R method has already been introduced, but the community has not yet implemented it.” (KI.2)

Based on the interview findings, the researcher concludes that the West Aceh Environmental Agency faces significant challenges in improving the effectiveness of waste management due to low public awareness of environmental cleanliness. Community behavior remains one of the main factors hindering the success of sanitation programs. This phenomenon indicates that educational and participatory approaches implemented by the government have not yet achieved full effectiveness.

“Follow-Up Actions of the West Aceh Environmental Agency”

“Socialization activities are carried out to teach waste segregation and to prevent disease-related impacts. The current achievement rate is around 60–70%, and it is targeted to increase to 80–90% so that West Aceh can become an ADIPURA city.” (KI.1)

“... socialization is also conducted to raise public awareness about the dangers of improper waste disposal. For those who repeatedly violate the rules, we continue to enforce strict measures. Many banners have been installed at several points, although it is impossible for us to place them along every road.” (KI.2)

"Our routine programs have already reached about 80% implementation ... moving forward, we plan to introduce new initiatives such as comparative studies to regions that have successfully managed waste, so that their practices can serve as a model for us here ... "(KI.3)

Based on the interview findings, the researcher concludes that the socialization strategies implemented by the Environmental Agency (DLH) have been relatively effective; however, they continue to face challenges related to outreach coverage, community participation, and the development of sustainable innovation policies needed to support West Aceh's goal of becoming an environmentally oriented city.

DISCUSSION

The Role of the Environmental Agency in Addressing Waste Accumulation in West Aceh Regency

The role carried out by the Environmental Agency (DLH) in waste management includes increasing public awareness and enforcing regulations to suppress the continuously rising volume of waste in the community (19). Rapid population growth and accelerated industrial expansion have contributed to the increasing volume of waste in residential and industrial areas, where consumption patterns also influence the diversity of waste types and the demand for industrial production. Therefore, as the responsible authority, the Environmental Agency is expected to play an active role in managing and reducing the growing waste volume (20).

The Environmental Agency of West Aceh Regency holds a strategic role in waste governance through a cross-sectoral collaborative approach. DLH functions not only as a technical executor of waste transportation and disposal but also as a facilitator that bridges cooperation among government institutions, communities, and the private sector through initiatives such as waste banks, community clean-up activities, and socialization on waste segregation. These findings align with modern waste governance theory, which highlights a transition from traditional bureaucratic systems to multi-actor governance, where local governments act as coordinators and network managers rather than sole implementers. In this context, DLH West Aceh demonstrates a relatively strong form of network governance, although its effectiveness still depends on the quality of coordination, clarity of inter-institutional roles, and active community participation.

However, gaps between policy and field implementation were also identified. Limitations in human resources, outdated organizational structures, and inadequate budgets frequently hinder the optimal execution of programs. This is reflected in the persistent buildup of unmanaged waste piles along urban and rural roadsides, creating an impression of disorder and uncleanliness in West Aceh. Such waste accumulation occurs largely because several stages of the waste management cycle, particularly waste collection from its source, are not implemented effectively.

A critical component of this system is transportation, which requires careful design to minimize the time needed to move waste from one location to another. This is particularly relevant for large-scale waste transportation, which requires intensive management to ensure efficiency. As part of the broader waste management system, transportation encompasses tasks such as collecting waste from various points and transporting it to treatment or final disposal sites using specially designed vehicles (21).

The implementation of the controlled landfill system by DLH West Aceh reflects a shift toward a more structured and environmentally conscious model of waste governance, consistent with principles of good waste governance that emphasize efficiency, transparency, and accountability. However, technical limitations and public behavioral challenges indicate that the effectiveness of transportation and waste management systems does not rely solely on institutional adaptability. Similar challenges have been documented in several Southeast Asian cities, including Bangkok and Manila, where the success of controlled landfill systems depends heavily on the synergy between technical efficiency and social acceptance. Thus, the experience of West Aceh suggests that effective urban waste transportation systems require approaches that are not only technocratic but also participatory and sustainable. Nevertheless, agencies like DLH cannot achieve their performance targets without strong support from competent human resources as the key drivers of organizational function.

The success of an organization is strongly associated with the quality of its human resources, which represent its most valuable asset and an essential source of motivation. Organizational performance is determined by outcome achievements at both unit and institutional levels, as organizations are essentially structured groups of individuals. Without adequate human resources, policy implementation within an organization is at high risk of failure (22).

Budget limitations in DLH West Aceh further illustrate the challenges of waste management, particularly regarding financial sustainability and organizational innovation. Although routine funding from the regional budget

(APBK) supports operational continuity, limited allocation for development restricts capacity-building efforts and the adoption of new technologies. Therefore, the success of waste management depends on a combination of competent human resources and sustainable financing systems that enable institutions to adapt and innovate in response to environmental complexities.

The budget also plays a critical role as an instrument for planning, controlling, and evaluating the performance of local governments. Additionally, it functions as a fiscal policy tool that determines the allocation of financial resources needed for agencies to conduct their programs, activities, and operations within a fiscal year. Budget preparation requires a carefully planned procedure to ensure that it functions optimally as a performance assessment instrument and supports the achievement of program objectives (23).

Facilities and Infrastructure of the West Aceh Environmental Agency

Cleanliness and aesthetic quality of a city depend on well-functioning infrastructure and facilities. These elements are essential because they serve as key determinants of whether a policy succeeds or fails. Therefore, the Environmental Agency provides a range of facilities and infrastructure to support efforts in building a clean and waste-free urban environment. The ability of sanitation workers to perform their duties efficiently depends on the availability and readiness of these facilities, which must be maintained in optimal condition at all times. Consequently, the management of facilities and infrastructure must be carried out systematically and effectively. Problems related to infrastructure and equipment are among the most common challenges faced by public service organizations.

A number of facilities and infrastructure provided by the Environmental Agency to support waste management including a fleet of only 30 vehicles, most of which are three- and four-wheeled, and the limited availability of Temporary Disposal Sites (TPS) managed by village authorities—indicate the presence of an infrastructure deficit within the sanitation service system. This condition is further exacerbated by the 2019 government regulation restricting DLH from procuring certain types of waste management facilities. Despite DLH's efforts to maximize available resources, these constraints remain insufficient to serve the entire region, which is geographically expansive and continues to experience growth in waste volume. As a result, waste collection is often delayed or inconsistently carried out. At present, the West Aceh Environmental Agency no longer provides trash bins for households or public facilities, as this responsibility has been transferred to the Public Works and Housing Agency (PUPR). The absence of new trash bin procurement has led to a shortage of standardized disposal points, contributing to irregular waste dumping practices and the use of non-standard containers. This situation complicates the waste collection process and increases the likelihood of improper disposal.

Sanctions of the West Aceh Environmental Agency

Sanctions are forms of punishment or consequences imposed on individuals or groups who violate established regulations. The effectiveness of sanctions is not only determined by the existence of a violation but also by the extent to which the sanctions provide legal benefits to both offenders and the wider community, particularly in preventing future violations and creating a deterrent effect for the public (24).

The Environmental Agency of West Aceh Regency has implemented law enforcement policies as part of its strategy to control illegal waste disposal. The enforcement of a fine of three hundred thousand rupiah for individuals who dispose of waste improperly, along with a tiered administrative sanction system for internal staff who violate regulations, reflects DLH's commitment to enforcing rules firmly and consistently. Additionally, DLH maintains internal discipline through a system of SP1, SP2, and SP3 warnings for employees who commit violations, including dismissal if the offense is repeated or severe. Thus, DLH West Aceh's sanction and disciplinary practices can be seen as part of broader efforts to build a more orderly, transparent, and equitable waste management system, while encouraging behavioral change among the community toward greater environmental responsibility.

Low public awareness and willingness to pay retribution fees remain major obstacles. Many residents consider the monthly fee of twenty thousand rupiah too burdensome or disproportionate to the quality of service received, while others choose to dispose of their waste improperly. In fact, for low-income households, the government has provided fee exemptions through certification issued by village authorities. Furthermore, although the retribution payment system has transitioned to an online platform to improve service efficiency, only about 25–30% of residents use the system. Low digital literacy and the public's preference for manual payment methods are the main reasons for the suboptimal adoption of this policy. Therefore, the retribution system in West Aceh must

be accompanied by efforts to increase public awareness, ensure transparency in the use of retribution funds, and strengthen digital education to improve community participation.

Increasing community participation in waste management can also be achieved through the application of sanctions for improper waste disposal. Because public satisfaction is an important indicator in assessing the effectiveness of a public organization, these issues are intrinsically connected to the level of community satisfaction with the services they receive.

Public Satisfaction in West Aceh Regency

Kotler (2004) states that the term “*satisfaction*” refers to an emotional state experienced by an individual as a result of comparing their expectations with the actual outcomes of the efforts they have made. Effective communication can improve public trust and satisfaction with organizational performance, making it a key determinant of public satisfaction toward government institutions (25).

The level of public satisfaction regarding waste management services in West Aceh remains relatively low. The dominant complaints delays in waste collection, inconsistencies in the retribution system, and the lack of responsiveness among waste collection personnel—indicate fundamental weaknesses in public service governance, particularly in terms of responsiveness, transparency, and accountability. Low public satisfaction is not merely a reflection of technical shortcomings; it also suggests a deficit of trust between the community and local government, which may hinder collaborative efforts needed to build a sustainable waste management system. When compared to broader trends in Southeast Asia, the conditions in West Aceh align with findings from cities such as Bangkok and Manila, where waste management systems face similar challenges including overlapping institutional authority, low public awareness, and limited institutional capacity. At the national level, this situation is also consistent with studies conducted in Medan and Surabaya, where key issues likewise revolve around weak coordination among transportation units and the lack of clarity in retribution mechanisms.

Supporting and Inhibiting Factors of the West Aceh Environmental Agency

The Environmental Agency of West Aceh Regency demonstrates a strong commitment to improving the effectiveness of waste management through recycling programs and cross-sectoral partnerships. The agency's role, which is increasingly oriented toward functioning as a facilitator and connector among stakeholders, reflects a paradigm shift from traditional bureaucratic models toward collaborative governance. This approach emphasizes the importance of synergy among government institutions, the private sector, and communities in fostering adaptive and sustainable waste management practices. At the Southeast Asian level, similar collaborative approaches have been proven effective in cities such as Penang, Malaysia, and several cities in China. Comparable phenomena have also been observed in Surabaya and Denpasar, where waste management effectiveness improved significantly following enhanced cooperation between local governments, cross-sectoral actors, and community groups.

The Environmental Agency of West Aceh Regency continues to face significant challenges in improving waste management effectiveness due to low public awareness regarding environmental cleanliness. Community behavior particularly the tendency to dispose of waste improperly remains a major obstacle to the success of sanitation programs. This phenomenon illustrates a gap between governmental policy and public behavior, which is often categorized as weak community participation in the implementation of environmental policies. At the regional level, similar challenges are experienced in cities such as Manila and Phnom Penh, where low public awareness and weak incentive systems have resulted in slow progress in waste reduction initiatives. Therefore, it is evident that the success of waste governance is not solely determined by the institutional capacity of government agencies, but also by the effectiveness of communication strategies, environmental education, and community participation, which together enable the sustainable integration of waste management systems.

Follow-Up Actions of the West Aceh Environmental Agency

Follow-up actions refer to activities carried out to identify and document the progress of implementing recommendations resulting from monitoring or audit processes, with the aim of improving program implementation effectiveness. Follow-up serves to ensure that the recommendations provided can be implemented properly and functions as a mechanism to assess program execution so that any deficiencies identified can be promptly addressed (26).

The socialization strategy undertaken by the Environmental Agency (DLH) of West Aceh Regency has been relatively effective in building initial public awareness regarding the importance of environmentally friendly waste management. However, this effectiveness continues to face challenges related to outreach coverage, community participation, and the lack of sustainable innovative policies needed to support West Aceh's vision of becoming an ADIPURA-standard environmentally oriented city. Thus, although the efforts of DLH West Aceh are on the right track, there remains a need to strengthen dimensions of social innovation and participatory engagement to ensure that the transition toward an environmentally conscious city can be realized comprehensively and sustainably.

CONCLUSION

This study demonstrates that the Environmental Agency (DLH) of West Aceh Regency holds a strategic role in regional waste management, functioning both as a technical executor and as a cross-sectoral facilitator. DLH has attempted to implement a more modern waste management system through the application of controlled landfill methods, waste bank programs, 3R socialization, and collaboration with communities and the private sector. However, the effectiveness of these initiatives continues to face several fundamental challenges, including low public awareness of environmental cleanliness, limited human resources, insufficient budget allocation for innovation, and inadequate facilities and infrastructure. These conditions reflect a persistent gap between policy and practice, which directly contributes to low public satisfaction with waste services, particularly in relation to delayed waste transportation and inconsistencies in the retribution system. Nevertheless, DLH West Aceh has demonstrated a strong commitment to continuously improving waste management through strengthening internal capacity, enforcing regulations against violations, and expanding public outreach efforts. Thus, waste governance in West Aceh should not be viewed solely as the responsibility of the government, but rather as the outcome of sustained collaboration among government agencies, cross-sectoral partners, private stakeholders, and the community in realizing a clean, healthy, and sustainable environment.

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