Multidisciplinary Output Research For Actual and International Issue (MORFAI Journal) ISSN (e): 2808-6635
Volumes 6 No. 2 (2026)

EVALUATION OF WASTE MANAGEMENT POLICY IN ACEH PROVINCE'S LANDFILL

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Received	: 20 November 2025	Published	: 15 January 2026
Revised	: 01 December 2025	DOI	: https://doi.org/10.54443/morfai.v6i2.4996
Accepted	: 30 December 2025	Publish Link	: https://radjapublika.com/index.php/MORFAI/article/view/4996

Abstract

Waste is a byproduct of human activity. Its presence is unavoidable and must be managed properly, as unsanitary waste management can lead to environmental pollution. This condition results in a decline in environmental quality and harms human health. One of the negative impacts of waste can arise from the source, where waste producers fail to properly handle waste. Research findings, including the limited number of human resources for landfill management, limited institutional frameworks for budget management, and the limited number of regional regulations established to support waste management policies in Aceh Province, indicate that waste management policies in Aceh Province still do not meet the criteria for adequacy as a public policy. The coverage of waste management services has only reached 66.73%, indicating that the Waste Management Policy at landfills in Aceh Province still does not meet the criteria for "equity" as a public policy in providing services to the community.

Keyword: Waste Management Policy, Landfill of Aceh Province

INTRODUCTION

One of the most common environmental problems is waste. Both organic and inorganic waste are the most common in residential areas. Indonesia produces an estimated 64 million tons of waste annually. According to data from the Ministry of Environment and Forestry (KLHK), organic waste dominates the waste mix. Plastic waste ranks second, followed by paper and rubber. Other waste includes metal, fabric, glass, and other types (Ministry of Environment and Forestry, 2017, cited in Widowati (2019). Rahayu and Sukmono (2013) state that waste is discarded material deemed useless but needs to be managed to prevent harm to the environment and public health. However, in reality, Indonesians are still reluctant to manage both organic and inorganic waste. Widowati (2019) states that public awareness in Indonesia regarding waste recycling is relatively low. Based on the 2018 Indonesian Environmental Statistics released by the Central Statistics Agency (BPS, 2018), only a small percentage of households recycle their waste. Meanwhile, other households manage waste by burning it. However, the smoke from burning can cause air pollution and harm health (Zuriyani, 2016). If waste management is not handled properly, it can cause various problems, even posing risks to human health and the health of other living things. Proper waste management is a series of activities that include collection, transportation, management, and disposal. Each of these activities is interconnected and reciprocally interconnected (Rizal, 2011).

Waste is a byproduct of human activity. Its presence is unavoidable and must be managed properly, as unsanitary waste management can lead to environmental pollution. This condition leads to a decline in environmental quality and harms human health. One of the negative impacts of waste can arise from the source, where waste producers fail to properly manage their waste. This can occur when waste producers refuse to provide trash bins at home and prefer to dispose of waste carelessly in drains or burn it, thus polluting the surrounding environment. The habit of burning waste can be said to be ingrained in Indonesian society (Hasbullah, 2019). The imbalance in waste management that occurs in rural areas, especially in densely populated residential areas, is caused by many factors, namely the ineffective role of waste management elements, the lack of facilities and infrastructure such as containers, collection facilities, the number and distribution of TPS and TPA land allocation, and limited funding. These limitations require local governments to innovate in an effort to solve these problems. Therefore, guidance is needed in residential waste management in rural areas as an effort to overcome and anticipate waste problems.

Waste is waste resulting from a production process, both industrial and domestic (household). Waste management is regulated in Law Number 18 of 2008 concerning Waste Management, emphasizing the need to change conventional waste management patterns to waste management that focuses on waste reduction and handling. Waste is a problem that must be faced by society, because waste is one form of environmental pollution, where human activities (external factors) cause foreign substances that were not originally present in the environmental area to enter the environment. Waste can be defined as a burden or valuable resource depending on how it is managed (Zaman, 2009: 1). According to Law No. 18 of 2008 Chapter 1 Article 1, waste is the remains of human daily activities and/or natural processes in solid form. McDougall et al. (2001: 1) define waste as something that is less useful and valuable, or useless remains. Waste is a product of human activity. Physically, it consists of the same material as useful goods, only distinguished by its lack of value. The lack of value or usefulness can be attributed to the mixing of waste and the unknown composition of waste.

According to the EPA Waste Guidelines (2009: 11) waste is anything that is discarded, rejected, abandoned, unwanted, or unused material, the unused material is not to be sold, recycled, reprocessed, repaired or refined by a separate activity that produces the material. In addition, waste is also defined as anything declared by environmental protection regulations or policies to be waste, whether valuable or not. From the various definitions above, there is a general similarity in the definition of waste, namely waste is material that is discarded and has reduced value. A slightly different thing was expressed by McDonough and Braungart (2002: 92) in Scheinberg (2010: 9) who said that waste has the same value as food. This statement can be interpreted as McDonough and Braungart view that waste has a very high and valuable value, even to the point of having the same value as food.

Waste is something that must be managed to add value, be reusable, and prevent environmental pollution. Historically, waste management has been identified with engineering functions. Increased production has created problems requiring landfills. The enactment of Law No. 32 of 2004 concerning Regional Government and Government Regulation No. 50 of 2007 concerning Procedures for the Implementation of Regional Cooperation has brought about changes in various aspects of regional governance, including regional cooperation. These changes are expected to lead to the creation of a better regional cooperation management system in an effort to optimally implement regional autonomy in accordance with the dynamics and demands of evolving communities. According to Law No. 18 of 2008, waste is defined as the solid residue of daily human activities and/or natural processes. Waste is a consequence of life, which often and in many places has caused problems. As the population and its activities increase, waste generation naturally also increases. An increase in population means an increase in the amount or volume of waste generated, while an increase in the types of activities means an increasing variety of waste types. The amount, volume, and types of waste that are allowed to accumulate are very dangerous for human life. Piles of waste are not only unsightly, but also require a significant amount of land for disposal, can cause disease in humans and pollute the environment.

Thus, waste management should be carried out based on the principles of responsibility, sustainability, benefit, justice, awareness, togetherness, safety, security, and economic value. With the enactment of Law Number 18 of 2008, the most important substance in waste management is that all district/city governments must change their waste disposal system to a waste management system. As stated in the fifth strategy in the Regulation of the Minister of Public Works Number 21 of 2006 concerning National Policy and Strategy for the Development of the KNSP-SPP Waste Management System, it is necessary to improve the quality of TPA management towards sanitary landfills. In addition, waste management activities with environmentally friendly principles have also been regulated in Law Number 18 of 2008 concerning waste management and Government Regulation Number 16 of 2005 concerning Drinking Water Supply Systems (Article 20). Environmental experts also recommend the appropriate final waste processing method is the Sanitary and fill method.

LITERATURE REVIEW

Definition of Waste

Humans undertake various activities to improve their well-being by producing goods from natural resources. In addition to producing goods for human consumption, they also produce waste materials that are no longer needed by humans. This waste is known as waste, which can be in solid, liquid, and gaseous forms (Saraswati, 2001). Environmental health experts have provided a discussion/definition of waste, including that waste is something that is not used, not liked or something that must be thrown away which generally comes from activities carried out by humans (including industrial activities), but which is not biological (because human waste is not included in it). The Indonesian National Health Education Center (1987) defines waste as objects that are not used, not wanted and thrown away, which come from an activity and are solid (excluding biological waste). Meanwhile, Nurmandi (2006) states that waste is the remaining material that has undergone some kind of treatment, either because its main part has been removed, or because it has been processed, or because it no longer has any use. From a socio-economic perspective, it has no value, and from an environmental perspective, it can cause pollution or disrupt sustainability.

Waste Management

Waste management in a city aims to serve the population for the waste they produce, which indirectly helps maintain public health and create a clean, good and healthy environment. According to the Aceh Provincial Sanitation Service (2016) to be able to manage residential or city waste which is increasingly large and a complex problem, an agency or institution is needed that is equipped with regulations, financing/funding, and supporting equipment which all form a system, high public awareness, local handling, and centralized management. The definition of waste management in developed countries, as proposed by Dalzell et al. (1984), is a discipline related to the control of waste generation, storage, transfer and transportation, processing, and disposal. According to Nurmandi (2006), in Indonesian cities, waste management uses two systems: the formal or conventional system and the informal or non-conventional system. According to Davey (2020), a levy is a direct payment by those who benefit from a service and is usually intended to cover all or part of the service costs. Meanwhile, according to Wardhani (2023), a levy is a payment for services provided directly by the state to interested parties. Meanwhile, according to Siregar (2020), a levy is a mandatory contribution to the government that provides direct service and can be demonstrated in return.

Community Participation in Waste Management

Good community participation will facilitate field operations and even reduce management costs. Therefore, a program is needed to improve this in an integrated, organized, and continuous manner, collaborating with community organizations. Soma (2005) states that humans influence their environment and also exploit its natural resources for their survival. According to Suriawiria (1996), a good environment can improve the quality of life, making everyone feel at home in their environment. Cleanliness and beauty are conditions that are in accordance with environmental management to fulfill the hope of creating a dynamically developing city that achieves balance between nature and humans.

RESEARCH METHODS

Types of research

In this study, the type of research chosen by the researcher is descriptive qualitative with the aim of evaluating the performance of waste management at the Aceh Province Landfill. This study was conducted in order to examine more deeply the evaluation of waste management performance in Aceh Province towards a Sanitary Landfill system by studying input performance, including technical, institutional, environmental, Human Resources (HR), legal regulations and funding aspects. Output performance of waste management includes aspects of community participation, technical aspects (service coverage) and environmental aspects.

Research Object/Subject

The object of research is waste management at the Aceh Province TPA, including technical aspects (compliance with technical standards for waste management provisions at the Aceh Province TPA), institutional aspects of the Aceh Province TPA managers and environmental aspects of the community around the TPA.

Data collection technique

This research requires a variety of data, both primary and secondary. Several data collection techniques were used in this study, including desk research, observation, interviews, and documentation. The purpose of the survey is to create a systematic, factual, and accurate description, picture, or illustration of the facts, nature, and relationships between the phenomena being investigated (Nasir, 2007). Interviews are needed to better understand the existing state of waste management at the Aceh Province Landfill and the problems faced by managers/institutions. A literature review is a step to identify theories, previous research results, and regulations closely related to the formulated problem. These theories/previous research results can be used as guidelines in determining methods/patterns for resolving the existing problem formulation. The literature review was obtained from literature books, research journals, scientific writing, and previous research documents.

The Waste Management Evaluation Process at the Aceh Province Landfill is carried out in stages following the Research Stages. The Research Stages include the Preparation Stage, Data Collection Stage, Data Analysis Stage, and the Final Research Stage. The Preparation Stage is carried out by determining the research idea/background, problem formulation, and establishing research objectives as described in the previous chapter. The data collection stage begins with data collection activities, namely primary data conducted through surveys/direct measurements in the field and interviews as well as secondary data. Furthermore, guided by the literature review, a descriptive qualitative analysis is carried out on the data obtained.

Data Analysis Techniques

In conducting a study of the steps required in efforts to improve TPA management towards a Sanitary Landfill system, a qualitative analysis was conducted on the evaluation data, both quantitative and qualitative/unmeasurable/unexplainable through quantitative analysis. All data from the evaluation of waste management input performance covering technical, environmental, funding, institutional, human resources aspects as well as output performance (community participation, environment and service coverage) in the waste management process at the Aceh Province TPA were then analyzed descriptively qualitatively to describe the phenomena obtained from the research results in detail. Furthermore, they were interpreted qualitatively with the meaning obtained from the research results. To obtain a depth of appreciation of the interaction between the concepts studied empirically, this study uses qualitative data analysis techniques. In the qualitative data analysis, the data found and collected were described and interpreted using easily understood words or sentences (Sanapiah Faisal, 1981).

Results and Discussion

Existing Waste Management in Aceh Province

According to SNI 19-3983-1995 on waste generation specifications for small and medium cities in Indonesia, the category of Small City is if the population is less than 100,000 people and Medium City is if the population is more than 100,000 people. Based on the population of Aceh Province at the end of 2014 of 151,960 people, then Aceh Province (with a population of 100,000<p<500,000. Waste management in Aceh Province is handled by the Sanitation and Parks Division of the Public Works Department. The Sanitation and Parks Sub-Department still uses an end-of-pipe solution approach, involving the collection, transportation, and disposal of waste to a final disposal site (TPA).

1. Waste Generation

   Referring to SNI 19-3983-1995 on waste generation specifications for small and medium cities in Indonesia, the average waste generation per person per day is 0.7 – 0.8 kg/person.day. Thus, if it is assumed that waste

generation per person per day is 0.75 kg and the population in Aceh Province at the end of 2014 was 151,960 people, then the potential waste generation in Aceh Province is 113.97 tons/day. This figure is the amount of potential waste generation in Aceh Province served by the TPA in Aceh Province.

2. Waste Management Infrastructure and Facilities
   The waste collection system uses an indirect individual pattern, where the waste collection process begins at the waste collection/retention points from both domestic and non-domestic waste sources. The Sanitation and Parks Division is responsible for transporting waste from the TPS (Terminal Sewerage) to the TPA (Final Landfill), using a fleet of waste handling vehicles (dump trucks and armrollers).
3. Human Resources Aspects
   Meanwhile, from the waste management resources, the number of employees in the Cleaning and Parks Sector is 327 people with a division of tasks including 24 office/administrative staff, 8 drivers, 164 street sweepers/cleaning task forces/yellow troops in the Aceh Province area, 50 street sweepers/cleaning task forces/yellow troops spread across the District Capital area in Aceh Province, 17 garbage collectors, 9 TPA officers.

Evaluation of Waste Management Input Performance at Landfills in Aceh Province

In this study, the input performance indicators are those used to implement waste management policies at landfills. Our survey reveals that the technical aspects of waste management at landfills in Aceh Province largely meet the requirements for operating towards a sanitary landfill system. However, in terms of the accuracy of the management method selection, the controlled landfill system implemented by the Aceh Provincial Government is still inadequate. Therefore, mandatory improvements are needed to be recommended so that it can be used to improve the waste management system from a controlled landfill to a sanitary landfill. Interviews with the Head of the Sanitation and Waste Section revealed that future challenges are related to the potential increase in waste generation as the population grows. On the other hand, the limited land available at the landfill in Aceh Province, especially for the current waste disposal area, is 2 hectares with an estimated service life of around 30 years. If the landfill in Aceh Province has been operating since 1992, the landfill will expire in 2022. Thus, in the next 7 years, the Government of Aceh Province will inevitably have to increase the amount of landfill area in the landfill in Aceh Province.

Environmental aspects

The success of waste management at the landfill is inseparable from the sustainability factor of the surrounding environment. Management at the landfill as stipulated in Law Number 18 of 2008 concerning Waste mandates that waste management at the landfill must be carried out while still paying attention to the comfort factor of the surrounding environment. Environmental experts also convey that the criteria for environmental comfort in waste management activities cannot be separated from 3 (three) criteria, namely no odor (no odor), no disease (does not cause disease) and no pollution (does not cause pollution to the environment). To determine the performance of waste management at the Aceh Province landfill whether it is in accordance with the provisions and criteria above, the researcher conducted an analysis through 2 (old) stages, namely the first by comparing the suitability of the criteria for selecting the Aceh Province landfill location with the provisions of SN I 19-3241-1994 concerning Procedures for Selecting the Aceh Province Landfill Location. Based on the criteria in the SNI, the selection of the Aceh Province landfill location is in accordance with the provisions (attached data).

The second stage is to conduct interviews with the community regarding the potential impacts arising from the operational activities of waste management at the landfill in Aceh Province. The environmental aspect analysis is carried out with an approach to the potential impacts that can be caused by waste management activities at the landfill as stated in the Regulation of the Minister of State for the Environment Number 11 of 2006, namely Gas/Air Pollution, Public Health and Pollution from Leachate. Through survey/observation activities at the landfill in Aceh Province (visual) and interviews with the community in the area around the landfill and institutions related to waste management (TPA) and the environment, it is hoped that the extent to which these potential impacts affect the environment around the landfill in Aceh Province can be identified. The distance from the location of the landfill in Aceh Province to the nearest settlement is approximately 1 km. The following are the results of interviews with the community regarding the impact parameters caused by the operational activities of the landfill in Aceh Province.

The results of interviews conducted with 100 respondents who live around the landfill site in Aceh Province showed that 76% of respondents stated that they were not bothered by the existence of the landfill in Aceh Province, while 13% stated that the landfill in Aceh Province could cause disease. Furthermore, only 6% of the community had the perception that leachate in the landfill in Aceh Province causes groundwater pollution and 5% of respondents stated that they were bothered by the smell of waste in the landfill. To determine the extent of waste management activities at the landfill in Aceh Province, interviews were conducted with the Lhok Rekam Village Government. The results of the interviews stated that several residents living around the landfill in Aceh Province suffered from leprosy. While medically stated that leprosy is more caused by germs caused by contact with the intermediary medium of the saliva of sufferers who have not been treated, so there is no correlation with the presence of waste at the landfill. Secondary data related to the number of diseases suffered by residents around the landfill in Aceh Province also explains that 10 (ten) types of diseases complained of by the community around the landfill in Aceh Province are not related to the operation of the landfill in Aceh Province.

Institutional Aspects

Institutionally, the Sanitation and Waste Sub-Division, which is the work unit responsible for waste management services in Aceh Province, is a work unit that is part of the SKPD of the Public Works Department in Aceh Province. This institutional form of waste management services has many limitations, primarily related to flexibility in budget management, the imposition of sanctions and rewards on the community in waste management, and the implementation of technical regulations related to waste management at both the central and regional levels. Currently, the implementing agency for the Regional Regulation on Waste Retribution issued by the Aceh Provincial Government is affiliated with the parent organizational unit that issued the regulation. This makes performance measurement difficult, as the organizational unit has a dual function as both planner and implementer. This is a different matter if the implementing unit were a single implementing agency.

Conclusion and Suggestions

1. The choice of a controlled landfill system for landfill management in Aceh Province does not meet the criteria for appropriate public policy. According to Law No. 18 of 2008, the appropriate method for waste management at landfills is the sanitary landfill system.
2. The lack of human resources for TPA management, the limited institutional forms in managing the budget and the still small number of regional regulations established to support waste management policies in Aceh Province indicate that waste management policies in Aceh Province still do not meet the criteria for adequacy as a public policy.
3. The limited budget amount indicated by the minimal amount of the waste management budget and waste levy revenue shows that the Waste Policy in Aceh Province still does not meet the criteria for effectiveness as a public policy.
4. The coverage of waste management services has only reached 66.73%, indicating that the Waste Management Policy at the TPA in Aceh Province still does not meet the criteria of "equity" as a public policy in providing services to the community.
5. The low level of public awareness in paying waste fees (3%) and the willingness to reduce waste at the source (22.67%) shows that the Waste Management Policy at the TPA in Aceh Province has not yet met the criteria for "responsiveness" of public policy.

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