

Challenges and Strategies of Waste Management by the Makassar Government

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Abstract

This study aims to analyze the challenges and strategies employed by the Makassar City Government in waste management. The method used is a qualitative approach, utilizing data collection techniques that include observation, in-depth interviews with cleaners, Environmental Service staff, waste bank managers, and residents, as well as documentation of related policies. This study was conducted in several sub-districts in Makassar City, which are the focus of waste management, including Panakkukang, Tamalate, and Manggala. The results of the study indicate that waste management in Makassar City still faces various challenges, including low public awareness of waste sorting, limited transportation fleets and personnel, and the capacity of the Antang Final Disposal Site (TPA), which is nearly fully utilized. Additionally, community participation in programs such as waste banks and the 3R approach is still low. In terms of policy, although Regional Regulations have been issued, weak supervision and law enforcement are the main obstacles. However, the Makassar City Government has implemented various strategies, such as involving technology through the "Makassar Recover" application, education programs in schools, and partnerships with the private sector through CSR. This study emphasizes the importance of enhancing institutional capacity, providing continuous education, and fostering synergy among the government, community, and private sector to establish an effective and sustainable waste management system in Makassar City.

INTRODUCTION

The problem of waste management has become an increasingly complex issue in various big cities in Indonesia (Abdussamad, Tui, Mohamad, & Dunggio, 2022; M. Daeni & Husnul Rizqi, 2021; Mulasari, Husodo, & Muhadjir, 2014; Wachid & Caesar, 2021; Wati, Rizqi, M. Iqbal, Langi, & Putri, 2021), including Makassar City. Along with population growth and increasing economic activity, the volume of waste produced by the community has increased significantly. Makassar City, as one of the metropolitan cities in eastern Indonesia, faces significant challenges in managing domestic and non-domestic waste effectively and sustainably. Waste that is not appropriately handled not only pollutes the environment

but also disrupts the city's aesthetics and has the potential to cause various environmentally related diseases.

The Makassar City Government has a big responsibility in ensuring that waste management runs effectively. However, in practice, there are still many obstacles to be faced, ranging from budget limitations and uneven infrastructure to weak monitoring and control systems for citizen behavior. According to (Supriyadi, 2012), the success of waste management is highly dependent on an integrated system between government institutions and public awareness. In Makassar, there are still many densely populated areas that are not routinely serviced by waste transportation services, resulting in the accumulation of waste at several points.

One of the main challenges in waste management in urban areas, including Makassar, is the inefficient waste sorting system from sources that has not been functioning well. Most people still dispose of waste in a mixed manner, without separating organic and inorganic waste. This complicates the recycling and further processing process. As stated by (Fitriani, Prarizky, Maghfiroh, & Rahmadurin, 2024), household sorting is the starting point of an efficient and sustainable waste management system.

In addition, the limited land for Final Disposal Sites (TPA) is a pressing issue in Makassar City. Antang TPA, the central location for waste disposal, is currently approaching its maximum capacity. In field observations, open piles of waste and the lack of a sanitary landfill system are serious threats to the surrounding environment. (Tchbanoglous & Kreith, 2002) explained that a poor TPA management system can cause groundwater and air pollution and have a negative impact on the quality of life of the surrounding community.

Inter-agency coordination in waste management remains an obstacle. Better synergy is needed between the Environmental Service, sub-districts, urban villages, and the private sector, as well as between these entities and communities. Lack of coordination often causes policies and programs to run out of harmony. (M. Daeni & Husnul Rizqi, 2021; Mayangkara, 2016; Wati et al., 2021) stated that weak cross-sectoral coordination is usually the leading cause of failure in implementing waste management policies in the regions.

Despite facing various obstacles, the Makassar City Government continues to seek strategic solutions to address these challenges. One of these is the use of information technology, such as through the "Makassar Recover" application, which is equipped with a feature for reporting waste complaints. This innovation is expected to enhance the response of officers in handling large amounts of waste. Setiawan and Ramdhan (2021) emphasize that the integration of technology in environmental management can increase the effectiveness of supervision and community involvement.

Another effort made by the government is to educate the community through environmental programs in schools and community training. Programs such as waste banks and TPS 3R have been developed in various regions. According to (Maulziandra, 2023), the benefits of managing Serasi Waste Bank in the social aspect of the community caring about waste and the environment. The economic aspect is still relatively small, yielding little income from weighing results, but it can add value to the community. This environmental aspect becomes cleaner, more beautiful, and safer.

However, the success of these programs is highly dependent on consistent implementation and strong policy support. Without firm sanctions, attractive incentives, and active field supervision, waste management strategies are vulnerable to being unsustainable. This is reinforced by (Tilbury, 1995) who stated that changes in community behavior can only be achieved if supported by a system that continuously educates, monitors, and provides feedback.

Based on this, this study aims to analyze the various challenges faced by the Makassar City Government in waste management and identify strategies that have been and can be implemented effectively. This study employs a qualitative approach to explore the perspectives of various stakeholders, including cleaners, residents, waste bank managers, and officials from the Makassar City

Environmental Service, to gain a deeper understanding of the dynamics of waste management policies at the city level.

METHOD

This study uses a descriptive qualitative approach to gain a deep understanding of the challenges and strategies implemented by the city government in waste management. This approach was chosen because it is appropriate for exploring complex social phenomena, such as the dynamics of public policy and the participation of various stakeholders in the waste management process. Data were collected through in-depth interviews, direct observation in the field, and documentation of related policies and programs. Research informants were selected purposively, involving environmental service officials, field officers, waste bank managers, and community leaders who play an active role in waste management.

The data obtained were analyzed using thematic analysis techniques, specifically grouping the data into main themes that aligned with the research focus. The analysis process was carried out through the stages of data reduction, data presentation, and conclusion. Data validity was maintained by triangulating sources and methods, namely comparing interview results with observation data and relevant documents. With this method, it is hoped that the research results will provide a comprehensive and in-depth understanding of the problems and strategic solutions in waste management by the city government.

RESULTS AND DISCUSSION

The study's results indicate that waste management in Makassar City continues to face numerous significant challenges. One of the main problems is the low level of public awareness regarding the proper sorting and disposal of waste. Many residents dispose of mixed waste without separating organic and inorganic waste. A cleaning officer from Panakkukang District stated,

"We have provided separate trash bins, but people are not used to sorting. Everything is mixed, even though this is very difficult at the processing site."

Additionally, the limited fleet and personnel of waste collectors pose a significant obstacle to effective management. Not all areas in Makassar City can be routinely reached by the collection fleet, resulting in the accumulation of waste at several TPSs. According to one of the staff members of the Makassar City Environmental Service,

"We are short of fleets. Ideally, one sub-district should have two to three fleets, but now it is still lacking. So, sometimes there are transport delays."

The condition of the Antang Final Disposal Site (TPA) is also a serious concern. This TPA is approaching its capacity limit and has not fully implemented an environmentally friendly management system. In direct observation, piles of garbage were seen that were not covered by soil and had the potential to pollute the surrounding environment. A resident who lives around the Antang TPA said,

"If the wind comes from the direction of the landfill, the smell reaches the house. It's been like this for a long time, but there's no solution."

This study also found that community participation in community-based waste management programs, such as waste banks and the 3R approach, remains relatively low. In several sub-districts, such as Tamalate and Manggala, waste banks already exist, but community involvement is inconsistent. A waste bank manager in Bangkala Village said,

"Initially, many were enthusiastic, but it gradually declined. Socialization from the government is also not routine."

The Makassar City Government has issued various policies to address this issue, including the Regional Regulation on Waste Management. However, in its implementation, there are still obstacles to supervision and law enforcement. An official at the DLH said,

"The regulation already exists, the sanctions are clear, but in the field, supervision is still weak. We need more supervisory personnel."

As an innovative effort, the city government is also developing a digital reporting system through the "Makassar Recover" application, which has been expanded to include complaints related to waste. This application allows residents to report the location of waste accumulation directly.

"This is a form of digital participation. Residents can take photos and send them directly, then we follow up," said the application management staff at Makassar City Hall.

Environmental education has also begun to be encouraged through cooperation between the Education Office and the Environmental Office. In several elementary schools, training has been conducted on waste sorting and the use of mini-composters. An elementary school teacher in Ujung Pandang District said,

"We teach the children how to sort and compost, but there has to be continuity. If there is no support from home, it will be in vain."

The Makassar City Government has also begun to establish partnerships with the private sector through corporate social responsibility (CSR) programs. Assistance in the form of recycling facilities, waste sorting tools, and training for community groups has been carried out in several areas.

"We help with shredders and composters. But we still need assistance from the government so that residents understand how to use it," said a representative of one of the companies in the Makassar Industrial Area.

Overall, the results of this study indicate that waste management in Makassar City still faces complex challenges, both in terms of technical, regulatory, and community participation. Although various strategic efforts have been made, the success of waste management is highly dependent on the synergy between the government, community, and private sector. Increasing institutional capacity, continuous education, and a strong monitoring system are the keys to realizing effective and sustainable waste management in Makassar City.

Waste management in Makassar City faces various challenges that reflect the weak integration between technical, institutional, and community behavior aspects. One of the main obstacles identified is the low public awareness of waste sorting. This is in line with the opinion of (Supriyadi, 2012) which states that changes in community behavior are the primary key in urban waste management. When the community does not yet have a culture of sorting waste from its source, the recycling and further processing processes will not run optimally.

The inadequate condition of the fleet and personnel of waste collectors in Makassar City indicates a problem in the planning and financing aspects of waste management. According to (Fitriani et al., 2024), limited facilities and infrastructure are common challenges faced by local governments in providing cleaning services. Delays in transportation lead to waste accumulation and disrupt the environment's aesthetics and health, potentially causing social conflict within the community.

A more serious problem lies in the condition of the Antang TPA, which is approaching its capacity limit. This indicates that the implementation of the principle is not yet optimal— Sustainable *waste management*. According to (Tchbanoglous & Kreith, 2002), ideal landfill management uses a sanitary landfill system to minimize environmental pollution. However, in the case of Antang Landfill, this system has not been fully implemented, resulting in adverse environmental impacts, including air pollution and health problems for the surrounding community.

Community participation in community-based programs, such as waste banks and the 3R approach, remains low. These results reinforce the notion that community participation in waste management will be more effective when accompanied by an educational approach and economic

incentives. Without ongoing motivation and support, programs such as waste banks will only run temporarily. Community inconsistency is also influenced by the lack of support from the local government in the form of training and monitoring.

Digital innovation efforts through the “Makassar Recover” application are a positive step to increase direct public participation in reporting environmental problems. In accordance with the opinion of (Setyaningsih et al., 2023), the use of information technology in waste management has the potential to increase the responsiveness and efficiency of public services. However, this innovation still requires the support of an even digital infrastructure and intensive socialization so that the public can access and use it actively.

Environmental education programs involving schools in Makassar are strategic preventive measures. This aligns with the theory of ecological education, as outlined by Tilbury (1995), which posits that education should be oriented towards long-term behavioral change. Student involvement in waste sorting practices can be a catalyst for change within their families. However, synergy between schools, the government, and parents is crucial so that this practice does not stop only within the school environment.

The proper and regular waste management method will certainly provide significant benefits for the environment, particularly in terms of the comfort and health of the local community. By arranging an effective waste collection, sorting, and processing system, the level of potential environmental damage to land and air can be more controlled. In addition to improving the aesthetic quality of the city by eliminating dirty piles of garbage and preventing the spread of diseases through unmanaged organic and inorganic waste sources, waste management is a crucial aspect of creating a clean, comfortable, and sustainable city.

In general, waste management in Makassar City needs to be improved through an integrated solid waste management approach involving all stakeholders systematically. Policy support, strengthening institutional capacity, and changes in community behavior are the main foundations for creating sustainable waste management. This study confirms that the success of waste management is not solely the responsibility of the government, but rather the result of collaboration among the community, the business world, and educational institutions.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research results, it can be concluded that waste management in Makassar City still faces various serious structural and cultural challenges. Low public awareness of sorting waste at its source, limited facilities and infrastructure such as transportation fleets and final disposal sites (TPA), and weak supervision and enforcement of regulations are the main obstacles to realizing an effective and sustainable waste management system.

Nevertheless, the Makassar City Government has demonstrated several strategic efforts to address these issues, including the application of digital technology, environmental education in schools, the development of waste banks and 3R TPS, and partnerships with the private sector through corporate social responsibility (CSR) programs. However, the effectiveness of these efforts is highly dependent on the consistency of implementation, active community involvement, and strong synergy between the government, communities, and business actors.

Therefore, further steps are necessary to strengthen institutional capacity, enhance the quality of education and ongoing socialization, and improve the inter-agency coordination system, ensuring that waste management in Makassar City operates optimally and contributes to creating a clean, healthy, and sustainable city environment.

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