



Inhibiting Factors in Coastal Wastel Management in Lawanga Tawongan Sub-District, North Poso City District

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Abstract. *This study aims to identify and analyze the inhibiting factors in coastal waste management in Lawanga Tawongan Sub-district, North Poso City District, Poso Regency. The method used is descriptive qualitative with three main focuses: Facilities, Public Awareness, and Supervision. Data sources were obtained through interviews, observations, and documentation, with primary and secondary data serving as references for analysis. The research findings indicate that facility-related issues are the main obstacles, marked by the limited number of Temporary Disposal Sites (TPS), the lack of waste collection vehicles, and the unequal distribution of trash bins in strategic locations. Public awareness regarding coastal cleanliness remains low, as reflected in the habit of littering and the lack of participation in cleanup activities. Furthermore, supervision from the sub-district government has not been optimal due to the absence of clear regulations or strict sanctions, as well as the lack of a community-based monitoring system. These conditions hinder the effectiveness of waste management efforts. Therefore, an integrated strategy is needed, including infrastructure improvement, environmental education, and the establishment of community-based regulations and supervision.*

Keywords: *Coastal waste management , waste management facilities , public awareness , environmental supervision*

1. Introduction

In recent decades, global environmental issues have become a major concern worldwide, particularly related to waste management, which has a significant impact not only on land but also on coastal and marine ecosystems. Waste, particularly plastic, poses a major threat to environmental sustainability. A report from the United Nations Environment Programme (UNEP) states that approximately 11 million tons of plastic enter the world's oceans annually, damaging marine ecosystems and threatening human life (UNEP, 2021).

As an archipelagic nation with the second-longest coastline in the world, Indonesia faces significant challenges in addressing coastal waste. According to data from the Ministry of Environment and Forestry (KLHK), approximately 80% of marine debris in Indonesia originates from land-based activities, such as the disposal of household and industrial waste through rivers and drainage channels, much of which consists of single-use plastics (suara surabaya, 2023). This situation reflects that waste management in Indonesia's coastal areas, including areas like Lawanga

Tawongan Village, is still far from ideal, both in terms of policy, infrastructure, and public awareness of plastic waste reduction.

Lawanga Tawongan, located in North Poso Regency, is one of the coastal areas directly impacted by this problem. With an area of only 0.74 square kilometers and a population of 2,137, the population density in this area reaches 2,888 people per square kilometer, indicating significant pressure on environmental carrying capacity. Although not formally divided into neighborhood units (RT/RW), this area still has local government structures such as the Community Association (RW) and Neighborhood Association (RT), which serve as the basis for public services. However, limited waste management infrastructure results in a large portion of household waste being poorly managed, ultimately polluting the coastal area.

The waste problem in Lawanga Tawongan is further complicated by the significant potential for nature-based tourism development, which should be a driver of the local economy. However, the beauty of the beach, a major tourist attraction, is threatened by the often-carelessly discarded waste. The accumulation of waste along Lawanga Beach not only damages the natural beauty but also negatively impacts public health, the local economy, and the environment as a whole. Furthermore, local communities dependent on marine resources, such as fishermen, also experience the direct impacts of pollution caused by waste. Therefore, it is crucial to comprehensively understand and address this issue.

Although numerous studies have addressed the issue of coastal waste and waste management in Indonesia, such as those by Jannah et al (2024) and Rahmansyah & Saadin, (2023) who examined coastal waste management strategies, and a study by Putri et al., (2024) on law enforcement in responding to the coastal waste phenomenon, it was found that there is still a significant research gap in the context of implementing effective waste management policies in coastal areas with tourism potential such as Lawanga Tawongan. Furthermore, research examining the relationship between waste management, community education, and nature-based tourism development in coastal areas is very limited. This leads to a lack of integrated solutions between government policies, community participation, and environmentally friendly ecosystem-based economic development.

This research aims to fill this gap by providing an in-depth understanding of the factors hindering coastal waste management in Lawanga Tawongan Village and formulating strategic recommendations that can be implemented to improve the effectiveness of waste management in the area. The research also focuses on understanding how local communities and various stakeholders can be involved in sustainable waste management to support the preservation of marine ecosystems, which are crucial for the economic sustainability and well-being of coastal communities.

The waste problem on the coast of Lawanga Tawongan is not only related to environmental cleanliness, but also closely related to sustainable development goals, particularly SDG 14 on "Life Below Water," which aims to conserve and sustainably

use marine, ocean, and coastal ecosystem resources. One of the main targets of SDG 14 is to reduce plastic waste that pollutes the sea and coastal ecosystems, which is also the main focus of this study. This study leads to the development of policies and programs that can help reduce plastic waste entering the sea and raise public awareness about the importance of maintaining beach cleanliness and marine ecosystem sustainability.

Through an integrated community-based approach, this research also supports SDG 12, which emphasizes responsible production and consumption. One important aspect of waste management is educating and empowering communities to minimize plastic waste and increase recycling. This research is expected to contribute to the achievement of the SDGs, particularly in the context of environmentally friendly waste management, community empowerment, and coastal ecosystem conservation in Indonesia.

This study offers an integrated approach to addressing waste issues in Lawanga Tawongan by combining community-based waste management, government policy, and nature-based tourism development. The novelty of this study is the application of a waste management model that involves all parties—including the village government, local communities, the private sector, and non-governmental organizations—in creating an efficient and sustainable waste management system. By utilizing the potential of nature-based tourism, this study also seeks to link waste management with local economic improvement through the development of environmentally friendly tourism.

In addition, this study also focuses on increasing public awareness and active participation in waste management, as well as the active role of the government in implementing supervision, which has been lacking in coastal waste management policies and practices. By understanding the interrelationship between waste issues, waste management policies, and tourism development, this research has the potential to become a model that can be adapted to other coastal areas in Indonesia, which face similar challenges in waste management and coastal environmental conservation.

2. Methods

This research was conducted in Lawanga Tawongan Village, North Poso City District, Central Sulawesi, which was chosen because it is a coastal area with a relatively high level of waste accumulation from domestic and marine activities. The research type used is descriptive qualitative, utilizing primary and secondary data. Primary data was obtained through field observations and in-depth interviews with key informants such as local communities, coastal residents, and government officials authorized in environmental management, while secondary data consisted of documents, reports, and regulations related to coastal waste management from relevant agencies. Informants were selected using a purposive sampling technique,

considering that they have direct involvement or adequate knowledge of waste management issues in the research area.

Data collection was conducted through observation, interviews, and documentation to obtain a comprehensive overview of waste management practices, coastal conditions, and the perceptions and constraints faced by stakeholders. All collected data were then analyzed using a qualitative descriptive approach through stages of reduction, categorization based on themes, presentation in narrative form supported by tables and figures, and drawing conclusions. The results of the analysis focused on identifying the main inhibiting factors in coastal waste management, which include limited facilities, low public awareness, and weak oversight mechanisms. This study can provide a comprehensive understanding of the dynamics of waste management in Lawanga Tawongan Village.

3. Results and Discussion

This study aims to identify factors inhibiting coastal waste management in Lawanga Tawongan Village, North Poso City, through three main focuses: facilities, public awareness, and supervision. Findings indicate that these three factors are interrelated, resulting in a suboptimal waste management system. The following is a thematic discussion of each factor.

3.1 Facilities

Facilities are the primary foundation supporting the success of a sustainable waste management system. Without adequate infrastructure, the entire chain of activities from sorting and collecting to transporting waste will face significant obstacles. Facilities in this context are not limited to Temporary Disposal Sites (TPS) and waste transport vehicles, but also include the availability of separated trash bins, initial waste processing systems (such as waste banks and community composters), and other supporting infrastructure that can enable the community to manage waste responsibly.

Field findings show that Lawanga Tawongan Sub-district still faces various limitations in terms of waste management facilities. The number of available TPS is very limited and not evenly distributed, making it difficult for many residents, especially those in densely populated areas, to access them. Furthermore, the existing TPS are often poorly maintained, overflowing, and not cleaned regularly, resulting in unpleasant odors and discomfort in the surrounding areas. On the other hand, the presence of separated trash bins is almost non-existent, whether in public facilities or household environments. This makes it difficult to consistently carry out waste sorting at the source.

In addition, waste transport vehicles which should be a vital element in supporting the waste transportation system are not operating on a regular schedule. The irregularity of waste collection leads to prolonged waste accumulation, causing foul odors and providing breeding grounds for disease vectors. In such conditions,

the community is often driven to take shortcuts, such as dumping waste into waterways, burning it in their yards, or even throwing it directly into the coastal area. These practices are a response to the failure of the waste management system that should have been provided by the local government.

This situation is not merely a technical issue but also directly affects community mindset and habits. When facilities are unavailable or do not function properly, people tend to normalize littering behavior as something acceptable in everyday life. This illustrates that infrastructure plays a role not only as a physical tool but also as a shaper of social behavior.

This condition aligns with the views of Titaley (in Saptenno et al., 2022) who emphasized that the lack of facilities can lead to increased waste buildup and push the public to dump waste into the sea or open areas. Sujauddin (in Sari et al., 2024) also noted that inadequate infrastructure is a major obstacle in the implementation of waste sorting programs. Meanwhile, Adicita et al., (2022) highlighted that the absence of adequate facilities can trigger habitual littering behavior

Therefore, the development of facilities must become a priority in waste management policies at the sub-district level. The government needs to provide TPS in strategic and densely populated locations, ensure the presence of separated trash bins in public facilities and residential areas, and implement a routine and transparent waste collection schedule. Adequate facilities not only support technical processes but also reflect the government's commitment to protecting the environment and public health.

3.2 Public Awareness

In addition to facilities, public awareness is also a crucial factor that determines the success of waste management. Findings show that residents in Lawanga Tawongan Sub-district still have a low level of awareness regarding the importance of maintaining a clean environment, particularly in coastal areas. Many residents do not yet understand why disposing of waste properly is vital, both from a health perspective and in terms of environmental sustainability.

Based on field interviews, it was found that some residents of Lawanga Tawongan Sub-district have begun to recognize the importance of environmental cleanliness especially among youth and certain groups of housewives. However, this awareness remains partial, has not developed into a collective movement, and has not reached all levels of the community. Many people still dispose of waste carelessly into gutters, onto the beach, or by burning it in their yards. This indicates that awareness has not yet evolved into a strong habit or social norm within the community.

The lack of environmental education from the sub-district authorities and related institutions is one of the causes of the low public awareness. Informants noted that announcements are limited to banners or verbal messages, without structured and continuous outreach programs. Furthermore, the community has

never been directly involved in training activities or environmental awareness campaigns that could foster a sense of ownership over the waste issue.

Rosdiana, (2022) states that public awareness is reflected in individuals' understanding, attitudes, and actions in responding to environmental problems. Budiharjo, (2017) adds that awareness emerges when people recognize their social rights and responsibilities. Moreover, Lolong et al., (2022) emphasize that awareness is shaped not only by formal education but also by the social environment, the example set by community leaders, and active involvement in environmental activities. In this context, the lack of education from sub-district officials, low participation from community leaders, and the absence of established social norms related to cleanliness indicate that efforts to build awareness have not been maximized.

Therefore, a holistic and participatory approach is needed. Activities such as regular community clean-ups, environmental awareness programs, and community-based waste awareness campaigns can be effective strategies in shaping more responsible behavior toward the environment.

3.3 Supervision

Supervision is also a vital component in supporting a waste management system. It functions as a form of social control to ensure that the community fulfills its responsibility in maintaining environmental cleanliness. Unfortunately, findings indicate that the supervision system in Lawanga Tawongan Sub-district is still very weak. The absence of formal regulations at the sub-district level, the lack of sanctions for violators, and the minimal reporting mechanisms render supervision merely a formality.

In Lawanga Tawongan Sub-district, the system for supervising public behavior regarding waste management remains highly ineffective. Based on interviews with neighborhood leaders (RT), community members, and sub-district officials, it was found that there are no formal local regulations governing the prohibition of littering or a system of sanctions for violators. Supervision is carried out only voluntarily, based on the initiative of neighborhood leaders, without structural support from the sub-district authorities. As a result, the public tends to view waste-related violations as minor issues, and littering behavior becomes normalized.

Putra, (2015) explains that supervision is part of the management function that ensures all activities proceed according to plan. Sahur (2021) states that supervision is essential to ensure alignment between execution and intended goals. Meanwhile, Chotimah et al., (2025) argue that weak supervision and low community participation lead to the absence of effective social control.

To address this issue, strengthening the supervision system can be carried out through the development of sub-district-level regulations on waste management, the establishment of environmental cadres, and the use of technology such as reporting

applications or resident communication groups. These steps aim to create a structured and sustainable supervision system while fostering collective awareness to maintain environmental cleanliness.

This research makes a significant contribution to understanding the factors hindering coastal waste management in Lawanga Tawongan Village, North Poso City. Findings regarding limited facilities, low public awareness, and a weak monitoring system indicate that waste management issues in coastal areas are not merely technical but also involve social, institutional, and behavioral aspects. The significance of this research is evident in how its results can serve as a basis for village and regional governments to design more targeted strategies, including providing infrastructure, increasing community environmental literacy, and establishing effective monitoring systems.

From an academic perspective, this research strengthens previous studies that emphasize that facilities play a crucial role in shaping community behavior toward the environment Titaley (dalam Saptenno et al., 2022); Sujauddin (dalam Sari et al., 2024). This research also adds a local, contextual dimension, namely how limited coastal facilities can lead to the behavior of dumping waste into the sea, which ultimately exacerbates coastal pollution and threatens the sustainability of marine ecosystems. This demonstrates that the coastal waste problem is inextricably linked to government policies, the availability of infrastructure, and local culture.

Furthermore, this research has practical significance as it can serve as a reference for local policies to strengthen community-based waste management. Recommendations regarding the provision of adequate waste disposal sites (TPS), the placement of segregated waste bins, regular collection schedules, and community involvement in outreach and monitoring activities can serve as a foundation for formulating more effective and sustainable waste management policies in coastal areas.

Although this study provides a clear picture of the factors hindering coastal waste management, there are several limitations that should be noted. First, this study was only conducted in one sub-district, so the generalization of the results to other coastal areas in Poso and other regions in Indonesia is still limited. Second, the research data is mostly based on interviews and qualitative observations, so it is not supported by quantitative data that could strengthen the validity of the findings, such as the amount of waste produced per day or the level of community participation in clean-up activities. Third, this study also did not explore in depth the role of the private sector and non-governmental organizations that have the potential to support coastal waste management in Lawanga Tawongan.

To overcome these limitations, further research is recommended to expand the scope of the study area in order to obtain a comparative picture between coastal villages. In addition, a mixed-method approach that combines qualitative and quantitative data will provide more comprehensive results. Future research also needs to examine more deeply the potential for multi-stakeholder collaboration,

including the role of schools, civil society organizations, and businesses in supporting sustainable waste management. Thus, coastal waste management efforts should not only rely on the government and the community, but also become a collective responsibility across sectors in order to preserve the coastal environment.

Conclusions

Research on the factors hindering coastal waste management in Lawanga Tawongan Village, North Poso City, has been successfully conducted and provides a clear picture of the challenges faced by coastal communities in waste management. The results indicate that limited facilities, low public awareness, and weak oversight are the main factors contributing to the suboptimal waste management system. The lack of Temporary Disposal Sites (TPS), the absence of segregated waste bins, and irregular collection schedules encourage people to take shortcuts by indiscriminately dumping or burning waste. This situation is exacerbated by low environmental awareness, characterized by the behavior of dumping waste into the sea and drains still considered normal due to a lack of education and community involvement in cleanup programs. Weak oversight, lacking regulations and strict sanctions, further reinforces the normalization of this behavior.

These findings confirm that the coastal waste problem in Lawanga Tawongan is not merely technical but also reflects interrelated social, cultural, and institutional issues. Therefore, this study emphasizes the importance of strengthening facilities, increasing public awareness through ongoing education, and improving the oversight system with a more structured and robust approach. Thus, this research provides a real contribution to local governments, communities, and other related parties in formulating coastal waste management policies and strategies that are more effective, sustainable, and able to involve all levels of society.

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Conflict of Interest

The author declares no conflict of interest in the execution and writing of this research.

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