Miracle Journal of Public Health (MJPH), Vol. 8 No. 2 December 2025
DOI: 10.36566/mjph/Vol8.Iss2/493
Website: https://journal.fikes-umw.ac.id/index.php/mjph
e-ISSN: 2622-7762

A Comparative Overview of the Behavior of Coastal and Mountain Communities in Household Waste Management in Mamuju District

Gambaran Perbandingan Perilaku Masyarakat Pesisir Pantai dan Pegunungan dalam Pengelolaan Sampah Rumah Tangga di Kecamatan Mamuju

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ABSTRACT

Solid waste generation in Indonesia reached 20 million tons in 2022, with household waste being the largest contributor at 39.98%. This study aims to compare household waste management behaviors between communities living in coastal and mountainous areas. This study uses a comparative quantitative research design with a cross-sectional approach. The total sample consisted of 225 respondents, comprising 150 respondents in the Tahaya-haya neighborhood and 75 respondents in the Ujung Bulo Wisata hamlet. The study was conducted in Tahaya-haya as a representation of mountainous areas and Karampuang Island as a representation of coastal island environments. Bivariate analysis showed a statistically significant difference in knowledge of household waste management between the communities of Tahaya-haya and Ujung Bulo Wisata (p = 0.001). Respondents in Tahaya-haya had a higher proportion of good and very good knowledge (90.6%) compared to Ujung Bulo Wisata (65.3%). Although all respondents in both areas showed a very good attitude (100%) towards waste management, this attitude was not fully reflected in actual practice. The most striking gap was seen in waste management actions, where Tahaya-haya showed better practices, while most respondents in Ujung Bulo Wisata were in the poor category. Recommendations for local governments to provide waste management infrastructure in coastal and mountainous areas.
Keywords: Behavior, waste management, coastal, mountainous

ABSTRAK

Timbulan sampah padat di Indonesia mencapai 20 juta ton pada tahun 2022, dengan sampah rumah tangga menjadi penyumbang terbesar yaitu sebesar 39,98%. Penelitian ini bertujuan untuk membandingkan perilaku pengelolaan sampah rumah tangga antara masyarakat yang tinggal di wilayah pesisir dan pegunungan. Penelitian ini menggunakan desain penelitian kuantitatif komparatif dengan pendekatan cross-sectional. Total sampel penelitian sebanyak 225 responden yang terdiri dari 150 responden di Lingkungan Tahaya-haya dan 75 responden di Dusun Ujung Bulo Wisata. Penelitian dilaksanakan di Tahaya-haya sebagai representasi wilayah pegunungan dan Pulau Karampuang sebagai representasi lingkungan pesisir kepulauan. Analisis bivariat menunjukkan adanya perbedaan yang signifikan secara statistik dalam pengetahuan pengelolaan sampah rumah tangga antara masyarakat Tahaya-haya dan Ujung Bulo Wisata (p = 0,001). Responden di Tahaya-haya memiliki proporsi pengetahuan baik dan sangat baik yang lebih tinggi (90,6%) dibandingkan Ujung Bulo Wisata (65,3%). Meskipun seluruh responden di kedua wilayah menunjukkan sikap yang sangat baik (100%) terhadap pengelolaan sampah, sikap tersebut tidak sepenuhnya tercermin dalam praktik nyata. Kesenjangan paling mencolok terlihat pada tindakan pengelolaan sampah, di mana Tahaya-haya menunjukkan praktik yang lebih baik, sementara sebagian besar responden di Ujung Bulo Wisata berada dalam kategori kurang baik. Rekomendasi bagi pemerintah setempat agar menyediakan infrastruktur pengelolaan sampah di wilayah pesisir dan pegunungan.
Kata Kunci: Perilaku, pengelolaan sampah, pesisir, pegunungan

Article Info:
Received: 25 Nov'2025 | Revised form: 26 Nov'2025 | Accepted: 19 Dec'2025 | Published online: December 2025

INTRODUCTION

The issue of household waste management remains a significant environmental health concern in various urban and semi-urban areas in Indonesia. Population growth and economic activity contribute to an increase in waste generation, while management capacity and community participation are not yet fully optimized. This situation places community behavior as an important component in efforts to achieve sustainable waste management and prevent environmental health risks. Mamuju Regency, as the capital of West Sulawesi Province, faces significant waste management challenges. Based on data from the Mamuju Regency Central Statistics Agency (BPS), Mamuju's population growth rate was 1.75% per year during the 2020-2023 period, far above the national population growth rate of only 1.1%. With a population of 292,395 in 2023, the volume of waste generated in Mamuju is estimated to reach 52,124 tons per year or around 142-143 tons per day. This figure continues to increase in line with Mamuju's economic growth as the center of the province's economic growth, which is marked by an increase in public facilities, malls, hotels, and restaurants.[1]

According to estimates from the Adiadi TPA UPTD, around 30-40% of the waste transported to the landfill still has economic value that can be recycled or resold, or can be turned into compost. If the community consistently sorts and reduces waste, the volume of waste transported to the landfill can be significantly reduced, thereby extending the landfill's lifespan. According to the head of the Adiadi Landfill Technical Implementation Unit, waste management by the community in Mamuju City is currently minimal, with the community doing very little to reduce and sort the waste they produce. The majority of the community disposes of waste directly without sorting it, so that almost all waste is transported to the landfill.[2]

The Mamuju sub-district has unique geographical characteristics with a combination of coastal and mountainous areas that create special challenges in waste management. This area covers 206.64 square kilometers consisting of coastal, marine, land, and mountainous areas, with an elevation of 0-500 meters above sea level. This diverse topography has resulted in two distinct communities: coastal communities and mountain communities, each with different lifestyles, livelihoods, and accessibility to waste management facilities.[3]

Research shows that coastal communities' awareness of waste management in Indonesia is still low, especially in terms of knowledge. Studies in various coastal areas show that although the attitudes and behaviors of the community are quite good, there are still significant gaps that need to be improved in the practice of household waste management. One of the main factors is that many coastal communities still dispose of waste indiscriminately into the sea, rivers, or yards without adequate socialization about proper waste management methods.

The level of public knowledge about the impact of waste and how to manage it properly shows a significant relationship with waste management behavior. Similarly, the level of education influences public perception and

participation in household waste management programs. People with higher levels of education tend to have a better understanding of the importance of waste management for environmental health.

A positive attitude towards environmental cleanliness shows a significant positive correlation with waste management behavior. Research in Ambon Bay, for example, found that although around 43.92% of respondents had a high level of awareness of waste management, there were still 30.41% who had low awareness.[4]

Previous studies have shown that waste management behavior is influenced by factors such as knowledge, attitude, and the level of education of the community. Studies in coastal areas show that although some communities have a positive attitude towards environmental cleanliness, good waste management practices are still inconsistent. On the other hand, studies in non-coastal or rural areas show that limited access and lack of education also contribute to low community participation. However, studies that directly compare waste management behavior between coastal and mountain communities in the same sub-district are still very limited.

Based on these conditions, there is a gap in research related to understanding differences in community waste management behavior based on geographical characteristics in the context of relatively similar waste management policies and systems. Therefore, this study aims to analyze differences in waste management behavior between coastal and mountain communities in Mamuju District. The novelty of this study lies in its comparative approach to waste management behavior based on geographical areas within a single administrative region. The results of this study are expected to form the basis for the formulation of environmental health promotion and behavior-based waste management strategies that are more contextual and effective.

MATERIALS AND METHODS

This study used a comparative quantitative research design with a cross-sectional approach. The comparative method was chosen to compare household waste management behavior between two areas with different geographical characteristics, namely the mountainous area (Tahaya-haya neighborhood) and the coastal island area (Ujung Bulo Wisata hamlet). The research population consisted of 345 households, and the research sample consisted of 225 respondents, comprising 150 respondents in the Tahaya-haya neighborhood and 75 respondents in the Ujung Bulo Wisata hamlet. The sample size was determined using the Slovin formula with a 95% confidence level and a 5% margin of error.

The research was conducted from January to July 2025, using a questionnaire to measure the respondents' level of knowledge, attitudes, and actions in waste management. Bivariate analysis was conducted to determine the differences in waste management behavior between the mountainous and coastal island areas. The statistical test used was the Chi-Square test to see the differences in the proportions of knowledge, attitude, and action categories between the two regions.

RESULTS

Based on the research results, data on the knowledge, attitudes, and actions of the community related to management in both regions were obtained and written in the form of the table below: Based on these conditions, there is a gap in research related to understanding differences in community waste management behavior based on geographical characteristics in the context of relatively similar waste management policies and systems. Therefore, this study aims to analyze differences in waste management behavior between coastal and mountain communities in Mamuju District. The novelty of this study lies in its comparative approach to waste management behavior based on geographical areas within a single administrative region. The results of this study are expected to form the basis for the formulation of environmental health promotion and behavior-based waste management strategies that are more contextual and effective.

Table 1. Distribution of Respondents Based on Community Knowledge in Household Waste Management

Location	Knowledge				Total	p-value
	Excellent (n%)	Good (n%)	Poor (n%)	Very Poor (n%)		
Tahaya-haya	23 (15,3%)	113 (75,3%)	14 (9,4%)	0 (0%)	150	0,001
The End of the Bulo Tour	1 (1,3%)	48 (64%)	26 (34,7%)	0 (o%)	75	
Total	24 (10,7%)	161 (71,6%)	40 (17,8%)	0 (0%)	225	

Source: Primary data, 2025

Table 2. Distribution of Respondents Based on Community Actions in Household Waste Management

Location	Actions				Total	p-value
	Excellent	Good	Not Good	Very Bad		
Tahaya-haya	1 (0,6%)	97 (64,3%)	52 (34,7%)	0 (0%)	150	0,000
The End of the Bulo Tour	2 (0,9%)	7 (9,3%)	67 (89,3%)	0 (0%)	75	
Total	**24 (10,7%)**	**161 (71,6%)**	**40 (17,8%)**	**0 (0%)**	**225**	

Primary Data Source, 2025

Table 3. Distribution of Respondents Based on Community Attitudes in Household Waste Management

Location	Attitude				Total
	Excellent	Good	Not Good	Very Bad	
Tahaya-haya	150 (100%)	0	0	0	150
The End of the Bulo Tour	75 (100%)	0	0	0	75
Total	**225(100%)**				**225**

Source: Primary Data, 2025

Table 4. Comparison of Waste Management Actions by Region

Actions	Region		p-value
	Tahaya-Haya	The End of the Bulo	
Bins ownership	141 (94%)	72 (96%)	0,544
Sorting waste	10 (6,7%)	2 (2,7%)	0,211
Recycle waste	2 (1,4%)	2 (2,6%)	0,492
Burning garbage	42 (28%)	54 (72%)	0,000
Providing indoor and outdoor bins	96 (64%)	31 (41,3%)	0,002
Have received waste management counseling	92 (61,3%)	4 (5,3%)	0,000

Source: Primary Data, 2025

Table 1 shows that the respondents in the Tahaya-haya neighbourhood have higher knowledge (75.3%) compared to those in the Ujung Bulo Wisata neighbourhood (64%). The Chi-Square test results show a p-value of 0.001 ($p < 0.05$), which means that there is a statistically significant difference in the level of knowledge of household waste management between the communities in the Tahaya-haya neighbourhood and the Ujung Bulo Wisata hamlet.

Table 2 shows that the good actions of respondents in the Tahaya-haya neighborhood are 64.3% higher than those in the Ujung Bulo Wisata village, which is 9.3%. The Chi-Square test results show a value of $p = 0.000$ ($p < 0.001$), which means that there is a very significant statistical difference in household waste management actions between the two areas.

Based on Table 3, the distribution of respondents according to community attitudes towards household waste management shows that all respondents had very good attitudes. In the Tahaya-haya area, 150 respondents (100%) were categorized as having very good attitudes, with no respondents found to have good, poor, or very poor attitudes. A similar condition was also seen in the Ujung Bulo Wisata area, where all 75 respondents (100%) had a very good attitude towards household waste management.

Based on Table 4, the attitude of respondents was 100% very good in the Tahaya-haya and Ujung Bulo Wisata villages. Based on the table above, a comparison of various waste management practices between the two areas can be seen. There was a significant difference in the practice of burning waste ($p = 0.000$), where the Ujung Bulo Wisata hamlet had a much higher prevalence (72%) than the Tahaya-haya neighbourhood (28%). Significant differences were also found in the provision of trash bins inside and outside the home ($p = 0.002$) and exposure to socialization ($p = 0.000$).

DISCUSSION

The results of the study based on the respondents' level of knowledge show that the level of knowledge of household waste management among the Tahaya-haya community is significantly better than that of the Ujung Bulo Wisata community ($p = 0.001$). Most respondents in Tahaya-haya were in the good knowledge category (75.3%), while in Ujung Bulo Wisata, the proportion of respondents with poor knowledge was still quite high (34.7%). The Chi-Square test results showed a p-value of 0.001 ($p < 0.05$), which means that there is a statistically significant difference in the level of knowledge of household waste management between the communities of Tahaya-haya and Ujung Bulo Wisata.

This significant difference indicates a knowledge gap that needs to be addressed through intervention, one of which is through targeted public health education, especially in Ujung Bulo Wisata. The high proportion of respondents with poor knowledge (34.7%) indicates the need for more intensive education programs.

Respondents in Tahaya-haya showed a much better level of knowledge, with 75.3% of respondents in the good knowledge category. In contrast, Ujung Bulo Wisata still faces significant

challenges with 34.7% of respondents having poor knowledge about household waste management.

Communities in coastal areas such as Ujung Bulo Wisata often face unique challenges. Research by Sebayang, 2017 shows that coastal communities generally have low economic status and knowledge, which affects their overall health behavior. In addition, infrastructure in coastal areas is often limited, with research noting that fishermen generally dive using makeshift equipment, indicating their weak economic capacity.[6]

The high proportion of respondents with poor knowledge in Ujung Bulo Wisata indicates a significant knowledge gap. The community's environmental health literacy is often limited to basic concepts, without covering practical skills for implementation. Research conducted by Hamidi, 2025 shows that the basic concept dimension achieved the highest score (82.1), while basic knowledge of specific environmental issues only achieved a score of 74.7.[7]

This phenomenon shows that general understanding does not automatically translate into technical skills. Research shows that low levels of health literacy are often associated with low educational attainment, but health literacy itself is shaped by a wide range of social factors and is not solely the responsibility of individuals to develop.[8] Research in other rural communities in Indonesia found that although the community had good knowledge about 3R waste management, its implementation was still very low.[9]

Geographical conditions are one of the obstacles to improving literacy. The characteristics of mountainous areas, which are relatively closer to government service centers and community activities, allow for better interaction with environmental health workers or community empowerment programs. In contrast, coastal communities tend to have limited access to information and still strongly adhere to traditional practices in handling waste.

The results of the research on attitudes show an interesting phenomenon where all respondents in both regions (100%) have a very good attitude towards household waste management. This finding shows that, normatively, the community understands and agrees on the importance of proper waste management. An analysis of attitude items shows that 99.5% of respondents strongly agree that disposing of waste in its proper place is the right thing to do, and a similar percentage agree that poorly processed waste can become a breeding ground for disease vectors.

This universal positive attitude is in line with research in Barrang Lompo, Lae-lae, and Lumu-lumu Islands, which found that coastal communities have a positive attitude towards waste management driven by a good level of knowledge.[10] Similarly, research in other parts of Indonesia shows that the majority of respondents have a positive attitude, with 53.6% strongly agreeing and 46.4% agreeing with good waste management practices.[11]

However, this positive attitude creates a paradox when confronted with actual practice. Although all respondents agreed on the importance of waste sorting, only 6.7% in Tahaya-haya and 2.7% in Ujung Bulo Wisata actually sorted their waste. Similarly, although respondents strongly

agreed that littering can damage natural resources, the practices of burning waste and dumping it in yards still dominate. Similar studies in Indonesia and various other countries show consistent patterns. A study in Tangerang found that although respondents had positive knowledge about waste management, their attitudes were negatively correlated with their behavior.[11]

This gap between attitude and action indicates structural barriers that prevent the translation of positive attitudes into real behavior. Interviews with the community and local government revealed that the community considers their waste management practices to be appropriate, even though in fact they are far from the standard.

This perception reflects the normalization of inappropriate practices due to a lack of exposure to better waste management alternatives. Challenging geographical conditions, the absence of temporary disposal sites, and a lack of socialization about appropriate and environmentally friendly waste management methods are structural factors that hinder the implementation of positive attitudes in practice.

Analysis of waste management actions shows significant differences between the two areas. The Tahaya-haya neighborhood shows better actions with 64.7% of respondents in the good category, while the Ujung Bulo Wisata hamlet shows alarming results with 89.3% of respondents in the poor category. This drastic difference can be explained by several crucial factors that distinguish the two areas.

First, accessibility and supporting infrastructure. Although both areas lack temporary waste disposal sites, the Tahaya-haya neighborhood has relatively better access to information and potential government intervention due to its location on the mainland. In contrast, the isolated hamlet of Ujung Bulo Wisata on a separate island faces much greater logistical challenges in accessing waste management services and educational programs. This is in line with research conducted in Bogota, which shows that limited access to waste sorting facilities, the absence of recycling facilities, and inefficient waste transportation systems drastically reduce the likelihood of participation. Communities cannot separate waste if the supporting infrastructure is not available, regardless of how positive their attitudes are.[12]

Second, the level of education and exposure to information. Higher levels of education in Tahaya-haya contribute to a better understanding of waste management practices. As many as 61.3% of respondents in Tahaya-haya had received information or education about waste management, while in Ujung Bulo Wisata, only 5.3% had. This disparity in access to education directly affects the community's ability to implement proper waste management practices. This is in line with research in Belawan, North Sumatra, which shows a significant relationship between knowledge ($p = 0.008 < 0.05$) and attitude ($p = 0.006, < 0.05$) and waste management behavior.[13]

Waste recycling practices are also very low, at only 1.4% in Tahaya-haya and 2.6% in Ujung Bulo Wisata, indicating that although respondents have a positive attitude towards waste utilization, actual practices are minimal.

Similarly, only 2% in Tahaya-haya and 5.3% in Ujung Bulo Wisata sort waste before disposing of it in temporary storage areas. To improve waste recycling and sorting practices in Tahaya-haya and Ujung Bulo Wisata, integrated interventions are needed, including: development of basic infrastructure for waste collection and processing, sustainable community education programs, development of economic incentive systems, and strengthening the role of local leaders in building positive social norms towards recycling.

A positive finding is that no respondents admitted to frequently littering in coastal or mountainous areas (100% answered no), indicating a basic awareness not to pollute conservation areas. However, the high practice of burning waste, especially in Ujung Bulo Wisata (72%), and the accumulation of waste in yards also have serious environmental impacts, even though they do not directly pollute the coast or mountains.

This study reveals an interesting phenomenon regarding the dynamics of the relationship between knowledge, attitudes, and actions in different geographical contexts. Health behavior theory generally assumes that good knowledge will form positive attitudes, which are then translated into appropriate actions. However, the findings of this study show that this linear relationship does not always occur in the context of waste management in areas with limited infrastructure.[14]

In the Tahaya-haya community, good knowledge (75.3%) and excellent attitudes (100%) correlate with relatively better actions (64.7%), indicating that under conditions of better accessibility, knowledge and attitudes can be more effectively translated into action. However, the gap between excellent attitudes (100%) and good actions (64.7%) indicates that there are still structural barriers preventing the full implementation of positive attitudes into actual practice.

The results of this study show that even though a person has an environmentally conscious attitude or belief, the absence of adequate information can prevent that person from acting effectively in accordance with their attitude and beliefs because information is a factor that influences a person's knowledge. In the environmental context, behavioral control perception includes a person's belief that they have the resources, knowledge, and opportunities necessary to perform the behavior. Without adequate information on how to act, intentions cannot be translated into behavior.[15]

In the hamlet of Ujung Bulo Wisata, although knowledge was relatively good (64%) and attitudes were very good (100%), the actions of the majority of respondents were relatively poor (89.3%). This huge disparity shows that external factors such as infrastructure, access to waste management services, and geographical conditions have a more dominant influence than internal factors (knowledge and attitude) in determining actual behavior. These findings are in line with research stating that one of the obstacles in implementing waste management is inadequate facilities and infrastructure. The geographical context presents unique challenges that affect the effectiveness of translating knowledge and attitudes into action.

In mountainous areas, steep topography and limited accessibility make waste transportation

expensive and difficult, so even though the community has good knowledge and attitudes, their practical options are limited to burning or dumping waste.[15] This is in line with research on waste management in mountainous areas, which shows that even though the majority of communities have good attitudes and behaviors towards waste management, the lack of adequate infrastructure and low awareness of waste management are major obstacles to the implementation of good waste management practices. The optimal solution requires a combination of intensive education, locally adaptive technology, strong institutions, and sustainable financial support.[16]

In coastal island areas, geographical isolation exacerbates the problem by limiting access to waste management services and exponentially increasing logistics costs. This is in line with research in the coastal area of Sebatik Island (Indonesia-Malaysia border), which found that waste management in coastal areas still faces significant challenges, including a lack of clear regulations and collaboration between stakeholders.[17]

Global research on waste management in coastal areas emphasizes that infrastructure development and land use must be considered by governments to support coastal communities in waste management and environmental sustainability. To achieve economic viability, regional cooperation through collaboration with surrounding areas can be beneficial in reducing the financial burden. In addition, good governance and an educational approach to raise awareness and change behavior are necessary to effectively manage the entire waste management system.[18]

This study reveals an interesting phenomenon regarding the dynamics of the relationship between knowledge, attitudes, and actions in different geographical contexts. Health behavior theory generally assumes that good knowledge will form positive attitudes, which are then translated into appropriate actions. However, the findings of this study show that this linear relationship does not always occur in the context of waste management in areas with limited infrastructure. In the Tahaya-haya neighborhood, good knowledge (75.3%) and very good attitudes (100%) correlated with relatively better actions (64.7%), indicating that under conditions of better accessibility, knowledge and attitudes can be more effectively translated into action. However, the gap between very good attitudes (100%) and good actions (64.7%) indicates that there are still structural barriers preventing the full implementation of positive attitudes into actual practice. The study states that even though a person has an attitude or belief of caring for the environment, the absence of adequate information can prevent that person from acting effectively in accordance with their attitudes and beliefs because information is a factor that influences a person's knowledge.

In Ujung Bulo Wisata Hamlet, even though knowledge was relatively good (64%) and attitudes were very good (100%), the actions of the majority of respondents were relatively poor (89.3%). This huge disparity shows that external factors such as infrastructure, access to waste management services, and geographical conditions have a more dominant influence than internal factors (knowledge and attitude) in determining actual

behavior.

These findings are in line with research stating that one of the obstacles in implementing waste management is inadequate facilities and infrastructure. The geographical context presents unique challenges that affect the effectiveness of translating knowledge and attitudes into action.[19]

In mountainous areas, steep topography and limited accessibility make waste transportation expensive and difficult, so even though the community has good knowledge and attitudes, their practical options are limited to burning or dumping waste. Friyadi's 2023 research states that areas with steep slopes can increase transportation costs to waste disposal facilities.[20] In coastal island areas, geographical isolation exacerbates the problem by limiting access to waste management services and exponentially increasing logistics costs.

CONCLUSION AND SUGGESTIONS

The results of the study show that there are significant differences in household waste management behavior between communities in mountainous areas (Tahaya-haya neighborhood) and coastal areas (Ujung Bulo Wisata hamlet). These differences are particularly evident in terms of knowledge and actions, although in terms of attitudes, all respondents in both areas showed excellent results.

The results of the study show that positive knowledge and attitudes do not automatically translate into effective waste management behavior, especially in areas with limited infrastructure and access to waste services. Geographical factors, regional isolation, lack of supporting facilities, and low exposure to education have proven to be structural barriers in shaping the behavior of communities in coastal and mountainous areas.

Based on the results of the study, it is recommended that the Mamuju Regency Government develop waste management policies based on regional characteristics. In coastal island areas, priority should be given to providing basic infrastructure such as temporary storage facilities, transportation systems that are adaptable to island conditions, and the development of local-scale waste management technologies that are easy for the community to implement.

For further research, it is recommended to use a qualitative or mixed methods approach to explore in greater depth the structural and social barriers that influence waste management behavior, as well as to evaluate the effectiveness of community-based intervention models in improving household waste management practices in coastal and mountainous areas.

CONFLICT OF INTEREST

The authors declare that all data and information presented in this paper have no conflict of interest with any party. This research was conducted independently without any personal, institutional, or sponsor influence or interest that could affect the results of the research.

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