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Community Participation Level in Waste Management in Kaimana Dis-trict, Kaimana Regency (Case Study of Kaimana Subdistrict and Krooy Subdistrict)

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A B S T R A C T

This study analyzes the level of community participation in solid waste management in Kaimana District, Papua Barat, focusing on Kelurahan Kaimana Kota and Kelurahan Krooy. A descriptive, qualitative, and quantitative approach was applied through a survey of 100 respondents using strati-fied random sampling. The findings reveal that community perception of environmental cleanliness is very good (score 4.0), while technical knowledge of waste management remains low (score 1.8). Community practices (2.5) and self-help facilities (2.2) are only moderately effective, reflecting lim-ited infrastructure and technical skills. Institutional support (3.3) and budget allocation (3.0) are relatively good, but regulations (2.8) and authority (2.5) are not yet optimal. Operational aspects show that waste collection is fairly effective (3.2), whereas temporary storage facilities (2.3) and final disposal sites (2.4) face capacity and quality challenges. These results highlight a gap between strong community awareness and limited practical implementation due to insufficient knowledge, facilities, and regulatory enforcement. Strategic recommendations include strengthening environ-mental literacy, enhancing institutional capacity, providing community-based facilities, and enforc-ing regulations to support sustainable waste management in Kaimana District

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INTRODUCTION

Waste is leftover material that is no longer wanted, or considered worthless, whether originating from human activities or natural processes (Prabawardani et al., 2021; Kodoatie, 2013). According to the Indonesian National Standard (SNI) No. T-13-1990, waste is defined as solid waste consisting of organic and inorganic substances, which are considered useless and need to be properly managed so as not to cause negative impacts on the environment and to protect the investment value of buildings. Community participation plays an important role in the success of waste management policies at the regional level. Active involvement of residents is not only necessary to address various technical and social issues in waste management, but also serves as a foundation for building collective aware-ness of the importance of a clean and healthy environment. This participation includes the communi-ty's contribution in formulating policy directions, implementation strategies, as well as the fair distribu-tion of responsibilities in management activities. Manurung (2008) emphasizes that participation is not merely physical involvement, but also reflects the rights and obligations of each individual to deter-mine common goals.

According to Sastoepotro (1988) in Nurwanda (2018), forms of community participation include thoughts, labor, skills, goods, and money, with the aim of improving community welfare and creating a healthy and clean environment. The basic principle of community participation is direct involve-ment, which will be achieved if the community participates from the beginning of the process to the formulation of the results. Active community involvement is a key factor in realizing an effective and sustainable waste management process. Through collective participation, a structured and responsive waste management system can be formed, with the main goal of creating a clean, healthy, and livable environment for all layers of society (Mulyanto & Tahyudin, 2019). Waste management can be considered optimal if all the components involved operate in a bal-anced manner and support each other. The important aspects of waste management include institu-tional frameworks, legal regulations, financing, technical and operational matters, as well as communi-ty participation. Imbalances or failures in the implementation of these aspects can lead to various prob-lems, one of which is the decline in environmental quality due to waste pollution. The central gov-ernment has strengthened its commitment and encouraged the active role of all elements, including local governments, in sustainable waste management efforts. One of the strategies promoted is to make waste an economic resource that can be utilized. The World Bank, in a report in September 2019, released global waste production data. The World Bank claimed that in 2016, 2.01 billion tons of waste had accumulated worldwide. If seen from the rate of Earth's population growth, especially urbanization growth up to 70%, then according to World Bank predictions, by 2050 the accumulation of waste will reach 3.4 billion tons.

The management and reuse of waste in developed countries has become an integral part of the rapidly growing industrial sector. Waste is no longer seen merely as refuse, but as a resource with economic value. In contrast, developing

countries still face various challenges in addressing waste problems, both in terms of technical aspects, institutional capacity, and public participation. According to World Bank data, budget allocations for waste management in various countries can reach 20 to 50% of total construction costs, demonstrating the importance of investment in an effective and sus-tainable waste management system. The Ministry of Environment and Forestry (KLHK) recorded that in 2020, the total national waste production reached 67.8 million tons. This amount is equivalent to about 185,753 tons of waste generated every day by a population of 270 million people, or an average of 0.68 kilograms of waste per person per day. This figure shows an increase compared to 2018, when the national waste volume was recorded at 64 million tons from a population of 267 million. This surge in waste production also exacerbates environmental problems, particularly related to the accumulation of waste at final disposal sites (TPA) which is becoming increasingly concerning.

Kaimana is the capital of Kaimana Regency, located in West Papua Province. Kaimana Regency was established based on Law Number 26 of 2002, with a total area of 36,000 km² and a population of 63,154 in 2021, which increased in 2022 (State Gazette of 2002 Number 124, Supplement to State Gazette Number 4245). The population increase mainly occurred in the capital area, Kaimana. The population in 2022 was 64,334 people, but it increased to 65,490 people in 2023 (BPS Kaimana Re-gency, 2024). This population increase is due to migration from villages to the city and the growing number of newcomers from outside Papua to Kaimana City (3.10% per year). The increasing popula-tion in Kaimana city has consequences for the rise in the amount or volume of waste in line with the growing number of products and consumption patterns of the community. The Environmental Service of Kaimana Regency, West Papua Province, has initiated a socializa-tion activity regarding waste management regulations as part of efforts to realize the "Kaimana Zero Waste" program. This program was officially launched by the Kaimana Regency Government togeth-er with the Regional Technical Implementation Unit (UPTD) for Integrated Waste Management on June 24, 2021 (Pratiwi, 2022). To address waste problems effectively, the socialization activities were focused on six strategic points in the city and its surroundings. The local government hopes that through this activity, neighborhood heads and residents can gain an initial understanding of waste management regulations, so that when the policy is implemented, the community will be ready and understand their roles and responsibilities.

The Regency Government issued Kaimana Regent Regulation Number 31 of 2021 concerning garbage disposal hours, referring to Regional Regulation Number 16 of 2018 concerning waste man-agement. The government stated that the socialization of regulations regarding waste management is expected to increase public awareness to manage household waste wisely and responsibly. Moreover, this activity also aims to foster compliance with the established waste disposal procedures, from Tem-porary Disposal Sites (TPS) to Final Processing Sites (TPA). The Regional Technical Implementation Unit (UPTD) of Integrated Waste Management of the DLH Kaimana is currently preparing the material for a Regent Regulation (Perbup) regarding the re-striction of plastic bag usage,

which is expected to be issued soon and start being implemented in 2023. However, until now, the regulation has not been implemented. In addition, the UPTD also plans to revise Regional Regulation (Perda) Number 16 of 2014 concerning Waste Management by adding an article that regulates sanctions for the community. Although Kaimana already has a Perda related to waste management, the regulation still has several weaknesses, one of which is the absence of provisions for sanctions against the community who litter or dump waste indiscriminately. Based on this background, this study was conducted to explore further the perspectives, behaviors, and par-ticipation of the community in waste management in the Kaimana area.

Waste management is a strategic challenge in supporting the sustainable development agenda in Indonesia, including in areas such as Kaimana District. Along with the increasing population and in-tensity of economic activities, the volume of household and commercial waste in Kaimana District is also increasing. Without an effective management system and active community involvement, waste can have negative impacts on health, the environment, and the city's aesthetics. Along with the increase in population and in order to make Kaimana a global tourist destination, it is necessary to evaluate the extent to which residents are aware of waste regulations and manage-ment, apply them correctly, and participate in accordance with regulations. This is due to the behavior of some people in Kaimana District who still dispose of waste in rivers rather than in the waste collec-tion points provided and the landfill created by the Kaimana Regency Government. In Kaimana Dis-trict, waste management still faces various challenges such as limited facilities and the absence of evaluations on community participation in environmental cleanliness programs. In fact, community participation plays a central role in determining the success of waste management programs, whether in sorting, collecting, or recycling waste independently or collectively. Thus, it is important to identify the extent to which the Kaimana community actively participates in waste management, as well as to analyze the various determinants involved, so that it can serve as a basis for the analysis of formulating more effective and sustainable policies. Therefore, studies on ef-forts to increase public awareness and participation in waste management are necessary as a response to the problems identified at the research location.

The purpose of this study is to measure the level of community participation in waste management in Kaimana District, to identify and analyze the factors that influence awareness, behavior, and com-munity participation in healthy and clean living related to waste management in Kaimana District, and to uncover the obstacles and challenges in waste management in Kaimana District (including the pro-vision of instruments in waste handling).

LITERATURE REVIEW

METHODOLOGY

Place and Time

This research was conducted in Kaimana District, Kaimana Regency, West Papua Prov-ince, covering an area of approximately 36,000 km2, over a four-month period, from Septem-ber to December 2025.

Tools and Materials

The tools used included a camera and voice recorder, writing materials, a location map, and an interview guide.

Research Method

This research employed descriptive, qualitative, and quantitative methods. The infor-mation and data collected in this study were obtained through qualitative and quantitative ap-proaches, with the aim of producing a clear and in-depth picture of community participation in waste management. The descriptive method was used to systematically describe various aspects related to the research subjects, including situations, behaviors, and social phenomena.

The data collection techniques used were the following approaches:

1. Field Observation
2. Interviews/Questionnaires
3. Documentation
4. Literature Review

Population and Sample

The population of the research was the residents of Kaimana District. The population was 43,023 in 2024, of which 23,085 were male and 21,591 were female (BPS Kaimana Regency, 2025). A sample will be drawn from this population using the Slovin formula: $\mathbf{n = N / (1 + N \times e^2)}$

n = number of samples
N = population size
e = margin of error (0.10)
With: N = 43,023, and e = 0.10, $e^2 = 0.01$
Calculation:
n = 43,023 / (1 + 43,023 × 0.01)
n = 43,023 / (1 + 430.23)
n = 43,023 / 431.23 ≈ 99.74

Therefore, the Slovin sample size is ≈ 100 respondents. The sampling technique used is Stratified Random Sampling because the population in Kaimana District consists of various groups (based on sub-districts). This stratification technique allows each group to be represent-ed proportionally. Kaimana District consists of two sub-districts: Kaimana Kota and Kroy. For stratification purposes, the sample size was 58 respondents in Kaimana Kota and 42 respondents in Kroy. Respondents were selected randomly to ensure representativeness across all segments of socie-ty, minimize bias, and facilitate group-by-group analysis.

Table 1. Population and research sample size in Kaimana City and Kroy Subdistrict

Sub-district	Population (people)	Proportion (%)	Sample size of 100
Kaimana Kota	25000	58,11	58
Kroy	18,023	41,89	42

As seen in Table 1 above, Kaimana Village contributed the largest number of respondents, with 58 respondents (58.11%). Meanwhile, Kroy Village contributed 41.89%, with 42 respondents. In line with demographic conditions, Kaimana Village is a center of economic and government activity with a higher population density. A balanced proportion of respondents from these two areas will be fundamental to providing a com-prehensive picture of the waste problem in Kaimana District. Kaimana Village represents the charac-teristics of a dynamic coastal urban area, while Kroy Village represents a densely populated residen-tial area that also borders directly on water. This is expected to help reflect actual conditions on the ground through analysis of community perceptions and participation in waste management.

Research Variables

The research variables consist of community perceptions, community knowledge, institutions, final processing sites (TPA), community practices, waste transportation, authority, regulations, temporary storage sites (TPS), self-help facilities, and budget. To determine the level of community participation in waste management, each indicator of each participation variable refers to a Likert scale or categories in descriptive analysis. In this measurement, researchers formulate a number of statements regarding the research topic and ask respondents to choose from a list of answers provided. The assessment scale refers to a Lik-ert scale or categories in descriptive analysis (Lionello et al., 2021, Table 2).

Table 2. Likert Scale Categories

Category	Score
Very good	4,0-5,0
Good	3,0-3,9
Quite good	2,0-2,9
Not good	1,0-1,9
Not good	0,0- 0,9

Data Analysis

Data analysis is carried out in a tabular and descriptive manner.

RESULTS *AND* DISCUSSION

The results of the identification of various factors underlying community participation in the Kaima-na District, based on quantitative data collected through questionnaires, aim to provide empirical evi-dence regarding the extent to which research variables play a role in shaping waste management pat-terns in the study area. From the level of knowledge to the availability of budget.

Average Score of Waste Management Variables in Kaimana District

The data presented from the results of this study reflects the answers of 100 respondents spread across Kaimana City Subdistrict and Kroy Subdistrict. Through the tabulation of aver-age scores for each variable, the relationship between the cognitive awareness of the communi-ty and the reality of waste management practices in the field will be seen. Overall, the results of the data processing are summarized and presented in Table 3.

Table 3. Scores of Waste Management Variables in Kaimana District

No	Variable	Average Score	Category
1	Public Perception	4,0	Very Good
2	Institutionalization	3,3	Good
3	Transportation	3,2	Good
4	Estimation	3,0	Good
5	Regulation	2,8	Quite Good
6	Authority	2,5	Quite Good
7	Community Practice	2,5	Quite Good
8	TPA (Final Processing Site)	2,4	Quite Good
9	TPS (Temporary Shelter)	2,3	Quite Good
10	Self-help Facility	2,2	Quite Good
11	Knowledge	1,8	Not Good

Cognitive Domain Analysis: Perception and Knowledge

Public perception of waste management showed an average score of 4.0, categorized as "very good," while public knowledge only scored 1.8, categorized as "poor." These results indicate that the public has a high level of awareness and concern for the importance of environmental cleanliness and the impact of waste on health and environmental quality. However, this is not supported by adequate technical understanding of proper and sustainable waste management. Accord-ing to Del Rey et al. (2021), positive environmental perceptions and attitudes do not necessarily translate into increased knowledge without the support of sus-tainable, practice-based environmental education.

Low levels of public knowledge indicate that understanding of waste sorting, house-hold waste reduction, recycling, and community-based waste management re-mains limited. This condition can lead to a low ability of the community to im-plement effective waste management behaviors, even though they have positive perceptions of the environment. Research by Aquan et al. (2024) explains the re-lationship between environmental knowledge, attitudes, and behavior, where low knowledge can hinder the development of concrete actions in environmental management. Furthermore, Goodale (2021) emphasized that environmental knowledge is a key factor in shaping public concern and pro-environmental be-havior.

Overall, the results of the cognitive domain analysis indicate a gap between pub-lic perception and knowledge regarding waste management. A

strong public perception provides crucial social capital to support environmental management programs. However, this need to be strengthened through increased knowledge capacity, environmental education, community-based outreach, and ongoing outreach. According to Santhyami et al. (2021), increasing environmental knowledge through education and participatory approaches can increase public awareness and positive behavior towards the environment. Therefore, strength-ening environmental literacy is a strategic step to increase the effectiveness of sus-tainable community-based waste management.

Psychomotor Domain Analysis: Community Practices and Facility Constraints

The psychomotor domain analysis results show that the community practices variable obtained an average score of 2.5 and the self-help facilities variable obtained a score of 2.2, categorized as "fairly good." This condition indicates that the com-munity has carried out several waste management activities, such as disposing of and collecting household waste, but these practices have not been implemented optimally and sustainably. The low achievement of community practices indicates that waste management behavior remains conventional and has not fully imple-mented the principles of reduce, reuse, and recycle (3R). Research by Wu et al. (2021) explains that waste management behavior is influenced by environmental knowledge, social norms, and community behavioral control over waste manage-ment activities.

The self-help facilities variable, which obtained a score of 2.2, indicates that limited facilities are one of the main obstacles to improving waste management practices in the community. These limitations include a lack of waste sorting facilities, basic transportation facilities, waste banks, and a lack of community-based waste pro-cessing facilities. Fitriani et al. (2024) explain that the limited availability of waste management facilities and infrastructure leads people to dispose of waste without sorting and further processing. Furthermore, Pahruddin et al. (2024) emphasize that limited waste management facilities and infrastructure are the main inhibit-ing factor in developing effective and sustainable waste management behavior at the household level.

The psychomotor domain indicates that successful waste management depends not only on public awareness but also on practical skills and adequate support facili-ties. The low level of community practice and self-help facilities indicates the need to improve technical skills through training, community mentoring, strengthening waste banks, and providing community-based waste management facilities. Asmal et al. (2023) state that community waste management behavior is strongly influ-enced by environmental knowledge, attitudes, and the availability of facilities. Furthermore, He et al. (2022) emphasize that action-related knowledge has a sig-nificant influence on community waste sorting and management behavior. There-fore, strengthening community capacity and providing waste management facili-ties are strategic steps to increase the effectiveness of sustainable environmental management.

Structural Analysis: Authority, Budget, Institutions, and Regulations

The structural analysis shows that the institutional aspect scored 3.3, categorized as good, indicating that the organizational structure and coordination of waste man-agement are quite effective. The existence of management institutions such as en-vironmental agencies, waste banks, and

community groups is a crucial factor in supporting sustainable waste reduction and management. This aligns with Minis-terial Regulation No. 14 of 2021, which emphasizes the importance of institutional structure and operational governance in community-based waste management and waste banks.

The budget aspect scored 3.0, categorized as good, indicating that financial support is available, but still requires improvement to support facilities, operations, and the development of the waste management system. Budget constraints often hinder the improvement of waste transportation, processing, and reduction facilities at the regional level. Research on waste policy governance in Indonesia shows that the effectiveness of waste management is greatly influenced by regional fiscal ca-pacity and the sustainability of environmental program financing (Hendrik, 2025). The regulatory and authority aspects received scores of 2.8 and 2.5, respectively, in the fair cat-egory, indicating that the implementation of regulations and the division of tasks between agen-cies have not been optimal. Regulations are already available through various regional regula-tions and government policies regarding waste management, but implementation in the field still faces challenges in coordination, oversight, and ensuring authority between agencies. This situation indicates the need for policy strengthening, regulatory enforcement, and synchroniza-tion of authority between regional governments, technical institutions, and the community to ensure more effective and sustainable waste management (Ratnasari et al., 2023).

Operational Technical Analysis: Transportation, TPS, and TPA

The operational technical analysis shows that the waste transportation aspect received a score of 3.2, categorized as good, indicating that the waste collection and distribution system from the source to the TPS and TPA is operating quite ef-fectively. Transportation is a key component of waste management services be-cause it determines the smooth flow of waste management. However, limitations in fleet size, transport capacity, and operational schedules remain challenges in vari-ous regions. Research in Subang Regency indicates that the effectiveness of waste transportation is greatly influenced by the number of fleets, service coverage, and the operational system for waste collection (Pratama & Sururi, 2023). The TPS (Temporary Storage Area) aspect received a score of 2.3, catego-rized as fair, indicating that temporary storage facilities still require capacity and management improvements. TPS serve a crucial function as transit points before waste is transported to the TPA or other processing facilities. However, inade-quate TPS conditions often lead to waste accumulation, environmental pollution, and public health problems. Waste management regulations emphasize that TPS (Terminal Waste Processing Sites) and TPS3R (Recycling and Recycling Places) must be supported by an integrated transportation and processing system for op-timal waste management (Salsabila et al., 2023).

The Final Processing Site (TPA) aspect received a score of 2.4, categorized as fairly good, indicating that final waste management still faces various technical and environmental challenges. Most TPAs in Indonesia still use open dumping systems, which have the potential to cause soil, water, and air pollution. Data from the 2024 National Waste Management Information System

shows that the capacity of sanitary landfills (TPAs) remains limited compared to the increasing national waste volume. Therefore, strengthening processing technology, reducing waste generation at source, and improving the sanitary landfill system are neces-sary to support sustainable waste management (Supyandi & Mayta, 2025).

Description of Research Instruments

Each variable is measured through specific indicators outlined in the questionnaire. The purpose is to provide a more in-depth overview of the tabulated re-sults. The following is a detailed description of the measurement focus on the main variables:

Knowledge and Perception Variables

Knowledge and perception variables are measured through several indicators related to public understanding of waste types, environmental impacts, the im-portance of sorting, and awareness of household waste management. This meas-urement aims to determine the extent to which respondents understand good and sustainable waste management systems. Public knowledge is a crucial aspect be-cause it influences mindsets and actions in maintaining environmental cleanliness. Research by Indres & Titik (2025) shows that public knowledge about waste is re-lated to an understanding of reduce, reuse, and recycle (3R) principles, as well as awareness of the impacts of environmental pollution caused by household waste.

Public perception is measured through indicators of views, assessments, and attitudes to-ward waste management services, including the effectiveness of waste disposal sites (TPS), transportation, and the government's role in environmental management. Positive perceptions tend to encourage public participation in maintaining cleanliness and support waste manage-ment programs. However, several studies indicate that there is still a gap between public knowledge and practices in waste management. Studies in the Brantas River Basin and the Randuputih Waste Disposal Site (TPS) found that low public perception is influenced by a lack of facilities, education, and government involvement in the waste management system (Rah-madiana & Berutu, 2022).

Community Practices and Infrastructure Constraints

Community practices are measured through indicators of actual community behavior in waste management, such as proper waste disposal habits, household waste sort-ing, involvement in environmental cleanup activities, and participation in waste bank or recycling programs. This measurement aims to determine the level of waste management implementation in daily life. Research by Khotimah et al. (2023) shows that community practices in waste management are strongly influ-enced by attitudes, environmental awareness, and community involvement in maintaining environmental cleanliness. Furthermore, community empowerment programs through education and waste banks have been shown to improve community skills in sorting and managing household waste independently.

Infrastructure constraints are measured through technical indicators related to the availability of waste management facilities, such as trash bins, waste disposal sites (TPS), transportation facilities, access to waste services, and other supporting fa-cilities. Infrastructure constraints are a significant factor

influencing the effective-ness of waste management at the community level. Several studies have shown that limited waste management facilities and infrastructure lead to communities still littering or openly burning waste. Studies in Jandi Meriah Village and Ti-wingan Lama Village indicate that inadequate supporting facilities and a lack of transportation services are major obstacles to the implementation of community-based waste management (Sari et al., 2023).

Authority, Budget, Institutional, and Regulatory Variables

The authority variable is measured through indicators of the division of tasks, re-sponsibilities, and coordination between agencies in waste management, while the budget variable is measured through the availability of operational funds, finan-cial support for infrastructure, and the sustainability of waste management pro-grams. This measurement aims to determine the extent of local government ca-pacity to support effective waste management. Research by Hendrik (2025) shows that the effectiveness of waste management is greatly influenced by the clarity of authority between agencies and the adequacy of the regional budget to support waste management services and the development of environmental facilities. Fur-thermore, local government policies regarding the allocation of environmental funds are a critical factor in the success of waste reduction and management pro-grams.

The institutional and regulatory variables are measured through indicators of the existence of waste management institutions, institutional coordination functions, the implementation of re-gional regulations, and the effectiveness of supervision and enforcement of waste-related regu-lations. Strong institutions will improve program coordination, transportation services, and management of waste disposal sites (TPS) and landfills (TPA). Meanwhile, regulations serve as the legal basis for implementing integrated and sustainable waste management. The Ministry of Environment and Forestry of the Republic of Indonesia (2021) emphasized that successful waste management is greatly influenced by regulatory support, institutional governance, and local government participation in implementing environmentally-based waste management pol-icies.

Transportation, TPS, and TPA Variables

Transportation variables are measured using indicators such as transporta-tion frequency, fleet availability, service capacity, and the timeliness of waste col-lection from the source to the TPS and TPA. This measurement aims to deter-mine the effectiveness of the waste management operational system in supporting environmental cleanliness. Research in Bandung City shows that low fleet capaci-ty and inappropriate transportation frequency are the main causes of waste ac-cumulation at TPS and delays in distribution to the TPA. Furthermore, a subop-timal transportation system can reduce the quality of waste management services in urban areas (Siregar & Pharmawati, 2024).

The TPS (Temporary Storage Site) and TPA (Final Processing Site) variables are measured using indicators such as facility capacity, infrastructure conditions, accessibility, management systems, and environmental impacts. TPS serves as a transit point for waste collection before being transported to the TPA, while the TPA serves as the final location for residual waste processing. Research

by Barat (2023) shows that the uneven distribution of waste disposal sites (TPS) and land-fills (TPA) leads to waste accumulation in certain areas, while TPA management still faces capacity constraints and suboptimal processing systems. Therefore, im-proving TPS infrastructure and implementing a sanitary landfill system at TPAs are crucial steps in supporting sustainable waste management.

Comparative Analysis of Average Scores between Kaimana City and Kroy Village

Table 3 presents a comparison of the average scores for each variable to examine differ-ences in participation and perception levels across the two case study locations: Kaimana City and Kroy Village.

Table 3. Comparison of the Average Scores of Each Variable Between Kaimana City and Kroy Sub-District

No	Variable	Kaimana City	Kroy Subdistrict	Difference
1	Public Perception	4,2	3,8	0,4
2	Institutional	3,5	3,0	0,5
3	Transportation	3,0	3,3	-0,3
4	Budget	3,0	3,0	0,0
5	Regulation	2,7	3,0	-0,3
6	Authority	2,5	2,5	0,0
7	Community Practices	2,0	3,0	-1,0
8	Final Processing Site (TPA)	2,3	2,5	-0,2
9	Temporary Storage Site (TPS)	2,3	2,3	0,0
10	Self-help Facilities	2,3	2,0	0,3
11	Knowledge	2,0	1,7	0,3

A comparison between Kaimana City and Kroy Village shows that public perception scores were highest in both regions, with scores of 4.2 in Kaimana City and 3.8 in Kroy Village, with a difference of 0.4. This finding indicates that communities in both re-gions have a positive view and awareness of the importance of waste management. Fur-thermore, the institutional variable also showed a relatively high score (3.5 in Kaimana and 3.0 in Kroy), indicating that the existence of management institutions and organiza-tional support have played a role in promoting waste management. According to Amir et al. (2025), institutional perception and support are important factors influencing the success of public participation in environmentally-based waste management.

On the other hand, several variables showed better conditions in Kroy Village compared to Kaimana City, particularly in transportation (3.3 compared to 3.0), regulations (3.0 compared to 2.7), community practices (3.0 compared to 2.0), and landfills (2.5 com-pared to 2.3). The largest difference was found in the community practice variable (-1.0), indicating that residents of Kroy Village are more active in waste management ac-tivities than residents of Kaimana City. This finding indicates that successful waste management is determined not only by perception and knowledge, but also by the im-plementation of community

behavior and support from operational systems such as waste transportation and processing facilities. Research by Handayani and Agussalim (2023) also shows that high community participation contributes to the effective imple-mentation of waste management policies at the local level.

The budget, authority, and waste disposal sites (TPS) variables showed similar values in both regions, indicating that funding capacity, division of tasks, and the availability of temporary shelters are rela-tively similar. However, knowledge scores were still relatively low in both regions (2.0 in Kaimana and 1.7 in Kroy), making this an aspect that requires attention through environmental education and outreach programs. Low community knowledge has the potential to hinder the implementation of waste reduction principles at the source. Nationally, Indonesia's waste management still faces major challenges, marked by the low level of managed waste and high dependence on landfills, so that in-creasing community capacity and strengthening the management system are urgent needs (Afnan et al., 2025).

CONCLUSIONS AND RECOMMENDATIONS

The knowledge and perception variables indicate that the public has a fairly good awareness of the importance of waste management and its impact on the environment. However, the community's technical knowledge regarding waste sorting and manage-ment still needs to be improved through ongoing education and outreach. The community practices and self-help facilities variables indicate that community participation in waste management has begun to develop, particularly in maintaining environmental cleanliness and conducting independent waste management. However, limited supporting facilities and low levels of community behavioral consistency remain obstacles to optimal waste management implementation.

The authority, budget, institutional, and regulatory variables indicate that the insti-tutional system and policy support for waste management are quite well established. However, inter-agency coordination, the effectiveness of regulatory implementation, and funding support still need to be strengthened to ensure a more effective and sustain-able waste management system. The transportation, waste disposal sites (TPS), and landfills (TPA) variables indicate that the technical operational system for waste management has been operating quite well, particularly in terms of waste transportation services. However, the capacity of TPS and TPA facilities and the quali-ty of operational facilities still need to be improved to reduce waste accumulation and support more environmentally friendly waste management.

Strategic recommendations that can be formulated based on the research results are as follows:

For the Regional Government (Kaimana Regency Environmental Agency):

a. The government is advised to shift from mere outreach to strengthening infra-structure. This includes increasing the number of Temporary Waste Disposal Sites (TPS) closer to residential areas and procuring more intensive waste collection vehicles.

b. Budget reallocation policies are needed that favor grassroots community em-powerment (RT/RW) as a stimulus for the independent cleanliness movement.

For the Kaimana District community:

a. Communities are expected to begin forming self-help groups such as "Waste Banks" at the local level to address limited government resources, so that inorganic waste can be managed as a source of economic value.
b. Encourage the culture of waste sorting at the source (at the household level) to reduce the burden of waste accumulation in the landfill.

For further research:

a. It is recommended to further research alternative funding strategies (such as company CSR programs or effective self-help contributions) to support the waste management system in the coastal areas of West Papua so that it does not only depend on the APBD.

FURTHER STUDY

This research still has limitations, so it is necessary to conduct further research related to the topic of Community Participation Level in Waste Management in Kaimana District, Kaimana Regency (Case Study of Kaimana Subdistrict and Krooy Subdistrict) in order to perfect this research and increase insight for readers.

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