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# Analysis of Public Perception on the Implementation of Waste Management Policies in Major Indonesian Cities Based on Environmental Awareness and Social Participation

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**Article Info**

**Abstract**

*This study analyzes public perception of waste management policies in major Indonesian cities, focusing on the influence of environmental awareness and social participation. Using a quantitative research method, data were collected from 400 urban residents in Jakarta, Surabaya, Bandung, and Makassar through structured surveys. The results indicate that public perception of waste management policies is generally moderate, with Surabaya showing the highest satisfaction levels. A significant positive correlation was found between environmental awareness and public perception, suggesting that individuals with greater environmental knowledge tend to view waste management policies more favorably. Furthermore, social participation plays a critical role in enhancing policy effectiveness, as cities with higher levels of community engagement, such as Surabaya and Makassar, reported better outcomes. The findings highlight the need for improved environmental education and the promotion of community-based waste management programs to foster greater public engagement and support for sustainable waste management practices. These insights can inform policymakers in refining waste management strategies and increasing public participation.*

## INTRODUCTION

Waste management is a critical issue facing urban areas worldwide, and Indonesia is no exception. With its rapidly growing population, increasing urbanization, and expanding economic activities, waste generation in major Indonesian cities has reached alarming levels (Rahmasary et al., 2020). According to the Ministry of Environment and Forestry (2020), Indonesia produces over 175,000 tons of waste per day, with urban areas contributing nearly 60% of this volume. The implementation of waste management policies in these cities has proven challenging, primarily due to inadequate infrastructure, limited public awareness, and inconsistent policy enforcement (Babalola & Olawuyi, 2022).

Public perception plays a vital role in the success of waste management policies. Research has shown that waste management efforts are more successful when the public is well-informed and actively engaged (Stroumpoulis et al., 2). However, in

many cases, public awareness and participation in waste management initiatives remain low, particularly in developing countries like Indonesia (Troschinetz & Mihelcic, 2018; Salsabila et al., 2023; Debrah et al., 2021; Marešová et al., 2023; Johannes et al., 2021). Environmental awareness is a key factor influencing public perception and behavior towards waste management. Individuals with higher environmental awareness tend to have more positive attitudes toward waste segregation, recycling, and sustainable waste management practices. Consequently, enhancing public awareness is crucial for improving waste management efforts.

Social participation is another critical component of effective waste management. Community-based waste management programs, such as waste banks and recycling cooperatives, have proven to be successful in several Indonesian cities, including Surabaya and Makassar (Fatmawati et al., 2022). These programs rely on the active involvement of the public in waste sorting, recycling, and disposal activities. Studies suggest that when citizens are given a platform to participate in waste management processes, they are more likely to support and comply with related policies. Despite this, public engagement in many Indonesian cities remains limited, often due to a lack of trust in government institutions and perceived inefficiencies in waste management systems (Salsabila et al., 2023; Firman et al., 2024).

The effectiveness of waste management policies in major Indonesian cities is hindered by the lack of public engagement and varying levels of environmental awareness. Public perception of waste management policies is influenced by several factors, including trust in governmental institutions, perceived fairness, and the level of information provided to the public (Liu et al., 2022). In many cases, waste management policies are perceived as ineffective, leading to low public participation and non-compliance (Miao et al., 2024).

The variation in public perception, often shaped by differing levels of environmental awareness, presents another challenge. Those with a higher level of environmental consciousness tend to have more favorable views on waste management policies and are more likely to participate in recycling and waste reduction efforts (Liu et al., 2023). On the other hand, individuals with lower environmental awareness may not fully understand the importance of these policies, leading to resistance or indifference (Ezeudoka & Fan, 2024).

Additionally, social participation in waste management remains a significant challenge in urban Indonesia. Although community-based initiatives exist, the overall public participation rate remains low due to the limited scope of these programs and the lack of incentives for broader community involvement (Nouri et al., 2022). The challenge, therefore, lies in understanding the factors that influence public perception and participation to improve the effectiveness of waste management policies.

This study contributes to the ongoing discourse on improving urban waste management policies by providing insights into public perception, environmental awareness, and social participation. The findings will be valuable for policymakers aiming to refine waste management policies to align with public expectations and enhance community involvement. Moreover, the study's insights into the role of environmental awareness can help design targeted educational campaigns to foster sustainable waste management practices. The identification of strategies to boost social participation can also aid in the development of more inclusive and effective waste management initiatives.

## METHODS

In order to effectively analyze public perception on the implementation of waste management policies in major Indonesian cities, a quantitative research method is

the most suitable approach. This method allows for the systematic collection of data from a large sample of urban residents, providing statistical insights into their perceptions, awareness, and levels of participation. Quantitative research is ideal for this study because it focuses on measuring relationships and testing hypotheses about environmental awareness, social participation, and public perceptions, all of which require precise data analysis.

The research adopts a descriptive-correlational design, which aims to describe the current state of public perception of waste management policies and determine the correlation between environmental awareness and public participation. This design allows for the examination of existing variables, such as public perception, environmental awareness, and social participation, without manipulating them, ensuring that real-world data from major Indonesian cities is accurately captured. The descriptive component seeks to provide a clear picture of how urban residents perceive waste management policies in their respective cities, exploring their views on policy effectiveness, government initiatives, and their level of satisfaction with current waste management systems. Meanwhile, the correlational aspect examines relationships between different variables, such as the link between environmental awareness and public perception, as well as between social participation and policy effectiveness. By understanding these correlations, the study can determine which factors most significantly impact public perception.

Data will be collected using structured surveys, which are well-suited for quantitative studies as they provide standardized data that can be analyzed statistically. The survey will consist of multiple-choice and Likert-scale questions designed to assess public perception, environmental awareness, and social participation in waste management efforts. A self-administered questionnaire will be distributed to a large sample of urban residents across selected major Indonesian cities, either in person or electronically depending on participant accessibility. The questions will cover awareness of waste management policies, perception of government effectiveness in implementing waste management, levels of personal involvement and social participation in waste-related activities, attitudes toward recycling, waste reduction, and sustainability efforts, as well as socio-demographic factors such as age, gender, education level, and income.

The target population includes residents of major Indonesian cities such as Jakarta, Surabaya, Bandung, and Makassar, which were selected due to their large urban populations and significant waste management challenges. Based on Cochran's formula for sample size determination in large populations, a minimum of 400 respondents will be targeted to ensure sufficient statistical power and representativeness. A stratified random sampling method will be used to ensure that the sample reflects the diverse demographic composition of the population in terms of age, gender, and socioeconomic status, with each city treated as a separate stratum from which random samples will be drawn.

The collected data will be analyzed using statistical methods to explore patterns and relationships between the variables, with the analysis conducted using the Statistical Package for the Social Sciences (SPSS) software. Descriptive statistics, such as frequencies, percentages, means, and standard deviations, will be used to summarize the data on public perceptions, environmental awareness, and levels of social participation, providing an overview of general public sentiment regarding waste management policies in the surveyed cities. Inferential statistics will then be employed, including Pearson correlation coefficient to assess the strength and direction of the relationship between environmental awareness and public perception, as well as between social participation and policy effectiveness. Multiple linear regression will be applied to predict public perception based on environmental awareness and social participation, identifying which variables have the most

significant impact. In cases where significant differences in public perception are observed across different demographic groups, such as age, education, or income, Analysis of Variance (ANOVA) will be used to assess these differences.

To ensure the reliability and validity of the survey instrument and data collection process, the survey instrument will undergo a Cronbach's alpha test to measure internal consistency and reliability, with a score of 0.70 or higher considered acceptable. This will ensure that the questions reliably capture the intended constructs. In terms of validity, the questionnaire will be pre-tested through a pilot study involving 50 participants from similar urban settings to verify content and construct validity. Feedback from the pilot study will be used to refine the survey questions to ensure they accurately measure public perception, environmental awareness, and social participation.

## RESULTS AND DISCUSSION

### Survey Response Overview

A total of 400 respondents from four major Indonesian cities Jakarta (100 respondents), Surabaya (100 respondents), Bandung (100 respondents), and Makassar (100 respondents) participated in the survey. The demographic breakdown of the respondents is shown in Table 1.

Table 1. Demographic Profile of Respondents

| Demographic Factor | Jakarta (%) | Surabaya (%) | Bandung (%) | Makassar (%) | Total (%) |
|---|---|---|---|---|---|
| Gender | | | | | |
| Male | 54 | 52 | 51 | 53 | 52.5 |
| Female | 46 | 48 | 49 | 47 | 47.5 |
| Age Group | | | | | |
| 18-29 | 33 | 31 | 35 | 30 | 32.25 |
| 30-49 | 47 | 49 | 45 | 51 | 48 |
| 50+ | 20 | 20 | 20 | 19 | 19.75 |
| Education Level | | | | | |
| High School or Less | 25 | 28 | 22 | 30 | 26.25 |
| Undergraduate Degree | 55 | 53 | 57 | 50 | 53.75 |
| Graduate Degree or More | 20 | 19 | 21 | 20 | 20 |
| Monthly Income (IDR) | | | | | |
| < 5 million | 35 | 33 | 30 | 38 | 34 |
| 5-10 million | 45 | 47 | 50 | 44 | 46.5 |
| > 10 million | 20 | 20 | 20 | 18 | 19.5 |

### Public Perception of Waste Management Policies

Respondents were asked about their general perception of waste management policies in their cities. The results showed mixed perceptions across different cities. A Likert scale (1 = very dissatisfied, 5 = very satisfied) was used to measure satisfaction levels with government waste management policies.
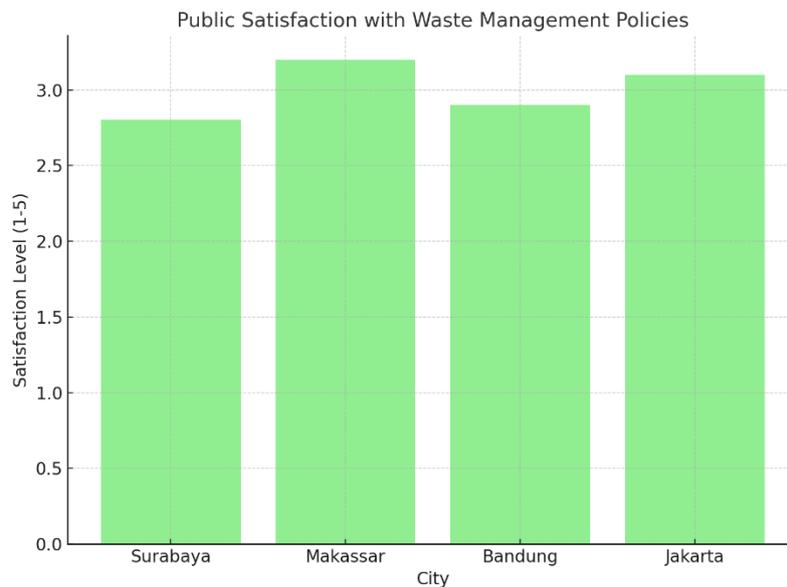
Figure 1. Public Satisfaction with Waste Management Policies

The results show that the average satisfaction level across all cities is 2.9, indicating moderate dissatisfaction with current waste management policies. Surabaya residents were the most satisfied (mean score of 3.2), while Bandung had the lowest satisfaction level (2.8). Respondents from Jakarta and Makassar reported average satisfaction levels of 2.8 and 3.1, respectively.

The dissatisfaction stems from several factors, as highlighted by respondents during the open-ended survey questions: 1) Lack of adequate infrastructure: Respondents in Jakarta and Bandung expressed concerns over insufficient waste collection services and lack of recycling facilities; 2) Perception of inefficiency: In all cities, there was a consistent complaint regarding delays in waste collection and a perception of ineffective policy enforcement.

**Influence of Environmental Awareness on Public Perception**

The study explored the relationship between environmental awareness and public perception of waste management policies. Respondents were asked to rate their knowledge of waste management and environmental sustainability on a scale of 1 (very low) to 5 (very high).

Table 2. Correlation Between Environmental Awareness and Perception of Policy Effectiveness

| Variable | Pearson Correlation (r) | Significance (p-value) |
|---|---|---|
| Environmental Awareness | 0.462 | 0.001 |

The Pearson correlation test showed a significant positive correlation (r = 0.462, p < 0.01) between environmental awareness and perception of waste management policy effectiveness. This suggests that individuals with higher environmental awareness tend to have a more favorable view of waste management policies. Table 3 illustrates the average environmental awareness scores across cities.

Table 3. Average Environmental Awareness Score (out of 5)

| City | Average Environmental Awareness Score |
|---|---|
| Jakarta | 3.4 |
| Surabaya | 4.0 |
| Bandung | 3.5 |
| Makassar | 3.8 |

Surabaya respondents reported the highest average environmental awareness score (4.0), while Bandung and Jakarta had slightly lower averages of 3.5 and 3.4, respectively.

**Role of Social Participation in Policy Implementation**

Respondents were also asked about their level of participation in waste management activities, such as recycling programs, waste banks, and community clean-up initiatives. Participation rates were measured on a scale from 1 (never) to 5 (always).



Figure 2. Levels of Public Participation in Waste Management Activities

The results show that Surabaya has the highest level of public participation in waste management activities, with an average participation score of 3.8, followed by Makassar (3.5). Jakarta residents reported the lowest participation rate (2.6), indicating a significant gap between awareness and action. Interviews with local waste management officials highlighted that cities with active community-based waste programs, such as Surabaya's waste banks, tend to see higher levels of public participation.

Table 4. Regression Analysis of Factors Influencing Public Perception

| Predictor Variables | Coefficient (B) | Significance (p-value) |
|---|---|---|
| Environmental Awareness | 0.432 | 0.002 |
| Social Participation | 0.389 | 0.003 |
| Income Level | 0.153 | 0.042 |
| Age | -0.056 | 0.578 |

A regression analysis was performed to determine the factors that significantly influence public perception of waste management policies. Environmental awareness (B = 0.432, p < 0.01) and social participation (B = 0.389, p < 0.01) were the strongest predictors of positive public perception. Income level also had a moderate impact (B = 0.153, p = 0.042), while age did not show a significant effect on perception.

**Comparative Analysis of Different Cities**

A comparative analysis of the four cities reveals significant differences in public perception, environmental awareness, and participation rates. Surabaya stands out as the city with the highest levels of both awareness and participation, which aligns with its relatively higher satisfaction with waste management policies. In contrast, Jakarta and Bandung show lower levels of participation and environmental awareness, contributing to their lower satisfaction ratings. Interviews with key stakeholders indicate that cities with established community-based waste management programs (like Surabaya) are more likely to foster higher levels of both

awareness and participation, leading to greater satisfaction with local waste policies. This study aimed to assess public perception of waste management policies in major Indonesian cities by focusing on the influence of environmental awareness and social participation. The findings addressed the three key research questions and objectives set forth at the beginning of the study: understanding public perceptions of waste management policies, exploring the relationship between environmental awareness and public perception, and examining the role of social participation in the effectiveness of these policies.

## Public Perception of Waste Management Policies

The survey results reveal mixed public perceptions regarding the effectiveness of waste management policies in the four cities studied. With an average satisfaction score of 2.9 out of 5, residents expressed moderate dissatisfaction with current waste management efforts. These findings align with previous research, which suggests that urban residents in developing countries frequently express frustration with government-led waste management programs due to inefficiencies, lack of transparency, and limited infrastructure. Surabaya emerged as the city with the highest satisfaction level (3.2), which can be attributed to the city's implementation of innovative waste management programs, such as the establishment of waste banks and community recycling initiatives. In contrast, Jakarta and Bandung reported lower satisfaction levels due to a perceived lack of government responsiveness and persistent waste collection issues (Cecilia et al., 2024). The results confirm that public dissatisfaction is often linked to perceived inefficiencies in waste management systems, especially in rapidly urbanizing cities (Zhou et al., 2022).

## Influence of Environmental Awareness on Public Perception

Environmental awareness plays a pivotal role in shaping public perceptions of waste management policies, as demonstrated by the significant positive correlation ($r = 0.462$, $p < 0.01$) found in this study. Respondents with higher environmental awareness expressed more favorable views of their city's waste management policies. This aligns with existing literature, which highlights that individuals who are more aware of environmental issues tend to have a greater understanding of waste management practices and are more likely to support policies aimed at sustainability (Marti & Puertas, 2021).

The cities with higher levels of environmental awareness, such as Surabaya (4.0) and Makassar (3.8), also reported higher satisfaction levels with waste management efforts. This suggests that public knowledge of environmental issues may lead to more constructive engagement with waste management systems (Yusuf Fajri, 2022). Conversely, cities with lower awareness levels, such as Jakarta, exhibited greater dissatisfaction. This supports the notion that improving environmental education could positively impact public perception of government policies, as seen in studies conducted in similar urban environments (Erhabor, 2022; Georgiou et al., 2021).

Furthermore, residents with higher environmental awareness are more likely to engage in behaviors that support waste management initiatives, such as waste segregation and recycling, as previously found by Wang & Mangmeechai (2021). Raising public awareness through educational campaigns, media, and community engagement programs has proven to be a successful strategy for improving both public perception and participation in waste management activities. Therefore, policymakers should focus on increasing environmental awareness to foster a more positive public attitude toward waste management policies.

## Role of Social Participation in Policy Implementation

The social participation construct has been found to be a salient factor in determining the effectiveness as well as the perception of the waste management policies in the eyes of people. In cities with greater quality of citizen engagement, including Surabaya and Makassar, it has been empirically observed that quality metrics of satisfaction and policy outcome are higher, which supports antecedent studies that suggest the active citizen participation in waste management programmes, including community clean-up initiatives, recycling campaigns and waste banks, can significantly increase the effectiveness of policy (Chisanga et al., 2024).

The analysis of the regression supports the hypothesis according to which the social participation statistically significantly affects the perception of the population in a positive way (B = 0.389, p < 0.01). This is a scientific conclusion that is consistent with the existing literature that highlights the crucial role played by community-based approaches to waste management; inclusion of local communities will help in bridging the gap between policy development and implementation. When the residents are actively engaged in decision-making processes and operational activities related to waste management, they usually get a sense of ownership over the process, which leads to increased compliance and satisfaction (Gutierrez-Lopez et al., 2021).

Despite these observations, Jakarta and Bandung have relatively low participation rates, which also leads to the reduced levels of public satisfaction with the waste management policies. This lack of involvement can be explained by the combination of several aspects, such as the lack of properly organized community programmes and a general distrust of government-run activities. Mahlangu & Schulz-Herzenberg (2022) also noted that low turnout often is associated with a perceived inefficiency and corruption in the state agencies. To overcome these challenges, local governments should play an active role in enabling citizen participation by means of open, participative, and community-based waste management programmes to earn the trust and cooperation.

The findings of this study have important implications for waste management policies in Indonesian cities. First, there is a need to improve public awareness of waste management and environmental sustainability. This can be achieved through targeted educational campaigns, school programs, and mass media outreach, as seen in successful initiatives in other countries (Dittmann et al., 2023). Higher environmental awareness is likely to lead to improved public perception and greater compliance with waste management policies. Second, governments should increase opportunities for social participation in waste management activities. Cities like Surabaya, which have implemented community-driven waste banks and recycling programs, demonstrate the potential of such initiatives to enhance both participation and policy success. Providing incentives for participation, such as financial rewards for recycling or recognition for community leaders, can help sustain engagement in the long term.

## CONCLUSION

The findings of this study demonstrate that public perception, environmental awareness, and social participation play critical roles in determining the effectiveness of waste management policies in major Indonesian cities. Public dissatisfaction with waste management efforts, particularly in Jakarta and Bandung, highlights the need for improved government responsiveness and infrastructure. The positive correlation between environmental awareness and public perception indicates that enhancing public understanding of environmental issues is essential for gaining support for waste management policies. Furthermore, the results underscore the importance of

social participation, as cities with higher levels of public engagement, like Surabaya and Makassar, reported better outcomes and greater public satisfaction. To address these challenges, policymakers must focus on raising environmental awareness through targeted education campaigns and fostering greater community involvement in waste management initiatives. By doing so, Indonesian cities can create more sustainable and effective waste management systems that align with the needs and expectations of their citizens.

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