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Public Awareness on Prioritization of Waste Management in Dagoretti North Constituency, Nairobi City County

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Abstract

Inadequate environmental education and weak dissemination of waste management information in Dagoretti North Constituency have contributed to widespread illegal dumping of solid waste. In particular, the Kiruta area of Kikuyuware has experienced persistent indiscriminate disposal along major access roads, creating serious environmental degradation and heightened public health risks for residents. Against this backdrop, the study sought to assess public awareness and prioritization of waste management within Dagoretti North, Nairobi City County. Specifically, the study examined the influence of disseminating waste management knowledge to the community, consulting residents on waste management priorities, collaborating with community members, and actively involving the public in waste management decision-making processes. The investigation was anchored in the social capital framework and a stakeholder perspective, recognizing the importance of shared norms, networks, and partnerships in addressing environmental challenges. A descriptive research design was adopted. The target population comprised 33 officers from the Department of Environment and Forestry in Dagoretti North and 20 managers from licensed waste collection companies, yielding a total census of 53 respondents. Primary and secondary data were collected using semi-structured questionnaires and guided interviews, with a pilot study conducted in Dagoretti South Constituency. Data analysis involved descriptive statistics and inferential techniques, including correlation and regression analysis. Findings revealed strong, positive, and statistically significant relationships between waste management and information dissemination ($r = 0.605$), community consultation ($r = 0.753$), community collaboration ($r = 0.690$), and community engagement ($r = 0.729$), all at $p < 0.05$. The study concludes that effective communication and inclusive community participation are critical to improved waste management outcomes. It recommends strengthening information-sharing systems and fostering partnerships among municipal authorities, waste management firms, local leaders, and community groups to develop localized, sustainable waste management programs.

Keywords: *Public Awareness, Prioritization, Waste Management, Dagoretti North Constituency, Nairobi City County*

1.0 Introduction

Waste management has emerged as one of the most pressing environmental challenges of the modern era due to rapid population growth, urbanization, and increased consumption patterns. The escalating volume of waste generated globally poses serious threats to ecosystems, public health, and sustainable development (Kathryn, 2019). Poorly managed waste contributes to water and air pollution, habitat destruction, and long-term environmental degradation, particularly through the accumulation of non-biodegradable materials in landfills (Rajesh & Mohini Kak, 2020; Tandon, 2020). Public awareness plays a central role in addressing waste management challenges. Awareness influences individual and collective behavior by fostering responsible waste disposal, recycling, and reduced consumption (Webler, 2018). When communities understand the environmental and health implications of improper waste handling, they are more likely to support sustainable waste management initiatives and policies (Musoke, 2018). Education, community engagement, incentive-based programs, public–private partnerships, and policy advocacy are key mechanisms through which public awareness translates knowledge into action (Nyirabu, 2018). Thus, public awareness acts as a critical bridge between environmental challenges and practical solutions.

Globally, waste management remains a shared challenge, with varying levels of success across countries. In Canada, strong public awareness and government commitment have shaped waste management practices over several decades. In 2018, Canada generated approximately 32.3 million tons of municipal waste, achieving a recycling rate of about 27.9% (Government of Canada, 2021). Legislative frameworks such as the Waste-Free Ontario Act and Extended Producer Responsibility programs in British Columbia demonstrate how coordinated policy and public engagement can improve waste outcomes (Recycling Council of Ontario, 2021). In contrast, India faces significant challenges due to its large population and diverse urban–rural context. Nearly 277 million tons of waste were generated in 2019, with only about 20% adequately treated (Ministry of Housing and Urban Affairs, Government of India, 2021). Nevertheless, public awareness campaigns such as the Swachh Bharat Abhiyan have increased citizen engagement in sanitation and waste management, supported by NGOs like the Chintan Environmental Research and Action Group (2021).

Low-income countries also confront acute waste management constraints. In Malawi, limited waste collection services result in open dumping and burning, with approximately 635,000 tons of waste generated annually (Lilongwe City Council, 2021). Public awareness efforts led by government agencies and NGOs emphasize waste minimization and recycling, supported by policy reforms aimed at improving infrastructure (UNDP, 2018). Similarly, Zimbabwe generates about 1.8 million tons of waste annually, with public awareness campaigns stressing recycling and proper disposal amid economic and infrastructural challenges (Zero Waste Trust Fund, 2021; Ministry of Environment, Climate, Tourism, and Hospitality Industry, 2021). In Kenya, waste management challenges are intensified by rapid urbanization, population growth, and increased consumption. The country generates over 22,000 tons of waste daily, with Nairobi as the largest contributor (Miringo, 2019). Inadequate waste collection infrastructure has led to illegal dumping and environmental health risks. Despite these challenges, initiatives such as RecyclePesa and the 2017 plastic bag ban illustrate progress driven by public awareness and policy interventions, although enforcement gaps persist (World Bank, 2019).

Public awareness is defined as the level of knowledge, understanding, and engagement that individuals and communities possess regarding societal issues, including environmental sustainability (Rodic, Modak, & Soos, 2019). In waste management, awareness is fundamental for influencing behavior and promoting participation across the waste management chain—collection, transportation, recycling, and disposal (Mavhungu & Mamphweli, 2018; Chidi & Mohammed, 2019). An informed public is more likely to adopt eco-friendly practices, advocate for improved regulations, and hold authorities accountable (Ogundipe & Babatunde, 2020). Public awareness also strengthens community engagement by encouraging collective action such as clean-up campaigns, recycling initiatives, and local waste reduction programs (Otieno & Omondi, 2020). Core components of public awareness include information dissemination, education, community engagement, advocacy, media communication, and government policy support. Accurate and accessible information delivered through media, schools, and public platforms forms the foundation of awareness (Park & Reber, 2018; Bonk & Graham, 2019). Community forums and advocacy efforts further reinforce shared responsibility and sustained participation (Aveling & Jovchelovitch, 2020; McCombs & Shaw, 2019; Cohen, Scribner & Farley, 2019).

International experiences highlight the effectiveness of strong public awareness. In Germany, stringent recycling systems and extensive public education have resulted in high citizen participation (Hassen & Rejeb, 2019; Mammou, 2020). Japan similarly demonstrates how early education and cultural values such as "mottainai" promote waste reduction and meticulous sorting (Ingabire & Morgenroth, 2019). In South Africa and Tunisia, public awareness initiatives supported by civil society organizations aim to address disparities in waste management practices across regions (Waste Management Legislation and Policy in South Africa, 2019; UNECA, 2019). Overall, public awareness campaigns are indispensable tools for fostering behavioral change and environmental stewardship. By educating citizens, encouraging participation, and supporting policy implementation, public awareness significantly enhances the effectiveness of waste management systems, particularly in rapidly urbanizing contexts such as Kenya (Kipchoge, 2021; Odinga, 2022; Mwangi, 2021; Mukome & Mbohwa, 2019; Wanjiru, 2022).

1.1 Statement of the Problem

Effective waste management is essential for sustainable urban development and public health. Nairobi City County, particularly Dagoretti North Sub-county, continues to experience severe waste management challenges driven largely by low public awareness and weak communication on the prioritization of waste management projects. Inadequate education and information dissemination have contributed to widespread illegal dumping, with major roadways and residential areas, especially in Kiruta, Kawangware, being converted into informal disposal sites. This has resulted in environmental degradation, foul odors, and increased risks of disease outbreaks due to pest breeding, posing a looming public health crisis, as highlighted by World Bank (2023). Waste spillages have extended into private properties, intensifying residents' hardships. Local communities attribute the situation to government inaction and the failure of enforcement agencies, including National Environment Management Authority (NEMA). While prior studies on waste management awareness have focused on institutional settings, this study addresses the gap by examining public awareness, consultation, collaboration, and involvement in prioritizing waste management projects within residential communities of Dagoretti North Sub-county.

1.2 Objectives of the Study

The objectives of the study where:

i. To determine the effect of information sharing the public on prioritization of waste management in Dagoretti North constituency, Nairobi City County
ii. To establish the effect of consulting the public on prioritization of waste management in Dagoretti North constituency, Nairobi City County
iii. To find out the effect of collaborating with the public on prioritization of waste management in Dagoretti North constituency, Nairobi City County
iv. To assess the effect of involving the public on prioritization of waste management in Dagoretti North constituency, Nairobi City County

2.0 Material and Methods

This study adopted a descriptive research design to examine how public knowledge influences the prioritization of waste management initiatives in Dagoretti North Constituency, Nairobi City County. The design facilitated the systematic collection of participants' views while enabling clear analysis of defined variables measured on an ordinal scale. The independent variables comprised dimensions of public participation, including information sharing (information accessibility and engagement levels), public consultation (representativeness, quality of input, and decision-making), collaboration (co-creation of priorities, sustainable partnerships, and shared decision-making), and public involvement (education and awareness, community engagement, and long-term planning). The dependent variable was the prioritization of waste management outcomes, operationalized through dumping site management and resident safety. The study was conducted in Dagoretti North Constituency, covering approximately 29 km², and targeted a total population of 53 respondents, comprising 33 officers from the Department of Environment and Forestry and 20 managers from licensed waste collection companies; due to the manageable size of the population, a census approach was applied.

Data were collected using semi-structured questionnaires and interview guides to capture both quantitative and qualitative insights aligned with the study objectives. A pilot study was conducted in Dagoretti South Constituency using 10% of the sample to refine the instruments, and pilot responses were excluded from the final analysis. Content validity was ensured through expert review, while reliability was assessed using Cronbach's Alpha, with a minimum acceptable

threshold of 0.70. Data collection commenced after obtaining institutional approval and authorization from the County Administration, and a drop-and-retrieve-later technique was employed to enhance response rates while ensuring confidentiality and voluntary participation. Quantitative data were analyzed using SPSS version 24 through descriptive statistics (frequencies, percentages, means, and standard deviations) and inferential techniques (correlation and multivariate linear regression), while qualitative data were examined through content analysis to identify recurring themes. Ethical standards were strictly observed, with participants informed of the academic purpose of the study, assured of confidentiality, and granted the right to withdraw at any stage; ethical approval was obtained from the University and a research clearance license secured from NACOSTI prior to data collection.

3.0 Findings and Discussion

This section presents a summary of the response rate, background characteristics of respondents, and the key findings from correlation and regression analyses. Out of 53 distributed questionnaires, 50 were returned, representing a 94% response rate, which was considered adequate for reliable analysis. The section further outlines respondents' demographic and professional profiles to contextualize the findings, followed by correlation analysis examining the relationships between public participation dimensions and waste management, and regression analysis assessing the extent to which information sharing, consultation, collaboration, and public involvement influence waste management prioritization in Dagoretti North Constituency.

3.1 Correlation Analysis

This study employed Pearson's correlation analysis to examine the relationship between public participation dimensions and effective waste management in Dagoretti North Constituency.

Table 1: Correlation Analysis

Variables	Information Sharing	Consulting the Public	Collaborating with the Public	Involving the Public	Waste Management
Information Sharing	1.000				
Sig. (2-tailed)					
N	45				
Consulting the Public	0.416	1.000			
Sig. (2-tailed)	0.076				
N	45	45			
Collaborating with the Public	0.981	0.987	1.000		
Sig. (2-tailed)	0.059	0.089			
N	45	45	45		
Involving the Public	0.974	0.987	0.976	1.000	
Sig. (2-tailed)	0.078	0.098	0.067		
N	45	45	45	45	
Waste Management	0.473**	0.541**	0.641**	0.741**	1.000
Sig. (2-tailed)	0.000	0.000	0.000	0.000	
N	45	45	45	45	45

The findings indicate that all examined aspects of public participation information sharing, public consultation, collaboration, and involvement have statistically significant positive relationships with effective waste management. Public involvement demonstrated the strongest association, suggesting that active citizen engagement in planning and implementation enhances ownership, accountability, and sustainability of waste management initiatives. Collaboration with the public also showed a strong positive relationship, highlighting the value of partnerships between local authorities and community groups in improving implementation efficiency and trust. Publicconsultation exhibited a moderate yet significant association, indicating that involving communities in decision-making promotes compliance with waste management practices. Although information sharing recorded the weakest correlation, it remained significant, underscoring the importance of transparent and timely communication in shaping public attitudes and encouraging responsible waste management behavior.

3.2 Regression Analysis

From the findings, the R Square value of 0.546 indicates that 54.6% of the variation in waste management in Dagoretti North Constituency can be explained by the combined influence of information sharing, consulting the public, collaborating with the public, and involving the public. This suggests that public participation plays a substantial role in shaping waste management

outcomes in the area. The remaining 45.4% of the variation could be attributed to other factors not captured in this model.

Table 2: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.739[a]	.546	.676	.64723

Table 3: ANOVA of the Regression Model

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	23.100	4	5.775	6.144	.000[a]
	Residual	42.308	45	0.940		
	Total	65.408	44			

From the findings, the ANOVA results of the regression model indicate that the overall model is statistically significant. The F-value is 6.144 with a significance value (p-value) of 0.000, which is less than the conventional threshold of 0.05. This implies that the combined effect of the independent variable's information sharing, consulting the public, collaborating with the public, and involving the public significantly explains the variation in the dependent variable, waste management in Dagoretti North constituency.

Table 4: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.041	.145		.260	.796
	Information Sharing	.436	.107	.548	5.548	.000
	Consulting the Public	.233	.081	.245	2.877	.006
	Collaborating with the Public	.237	.104	.179	2.356	.022
	Involving the Public	.026	.107	.548	2.570	.022

As shown by the equation below, the study also performed a regression analysis to determine the regression coefficients relating the independent and dependent variables: The study conducted a regression analysis to examine the effect of public participation strategies on waste management in Dagoretti North Constituency:

$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4$

Findings revealed that all four strategies information sharing, public consultation, community partnership, and engagement had positive and statistically significant impacts. Knowledge sharing had the strongest effect (B = 0.436, p = 0.000), indicating that a one-unit increase improved waste management by 0.436 units. Consulting the public (B = 0.233, p = 0.006) and partnering with the community (B = 0.237, p = 0.022) also contributed meaningfully. While public engagement had the smallest effect (B = 0.026, p = 0.022), it remained significant, confirming that increased public involvement positively enhances waste management outcomes.

5.0 Conclusion

The study concludes that public participation plays a decisive role in the prioritization and effectiveness of waste management initiatives in Dagoretti North Constituency. The findings demonstrate that information sharing enhances transparency, reduces misinformation, and promotes inclusive engagement, thereby significantly improving waste management outcomes. Public consultation strengthens democratic and needs-based decision-making by enabling communities to articulate pressing concerns and contribute meaningfully to project selection and prioritization. Collaboration between stakeholders further aligns waste management priorities with local realities, fosters collective responsibility, and strengthens accountability mechanisms. In addition, direct public involvement increases inclusivity, enhances community ownership, and supports sustained acceptance of waste management programs. The statistically significant positive relationships observed across all dimensions of public participation confirm that effective communication, structured consultation, strategic collaboration, and meaningful community involvement are essential for improving waste management performance. Overall, the study affirms that strengthening participatory approaches is critical for achieving sustainable and responsive waste management systems in rapidly urbanizing contexts.

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