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Municipal Waste Management and Its Impact on the Environmental Aesthetic Quality of Calabar Metropolis, Cross River State, Nigeria

By
Essien Maria Enoidem
Email:
Department of Environmental Education, University of Calabar, Nigeria

Abstract
Municipal waste management plays a crucial role in shaping the environmental aesthetic quality of urban areas. This study examines the relationship between municipal waste management practices, policies, and public participation with the environmental aesthetic quality of Calabar Metropolis, Cross River State, Nigeria. A correlational research design was employed, and data were collected through a researcher-developed questionnaire. Pearson's Product-Moment Correlation Coefficient was used for data analysis. Findings reveal a strong positive relationship between municipal waste management practices and environmental aesthetics, indicating that improved waste collection, disposal, and recycling significantly enhance urban aesthetics. Conversely, municipal waste management policies exhibited a very weak positive correlation with environmental aesthetics, suggesting that policy implementation may not be effectively translating into visible environmental improvements. Additionally, public participation in waste management demonstrated a very strong positive correlation with environmental aesthetics, emphasizing the critical role of community involvement in maintaining environmental quality. The study underscores the need for strengthened waste management practices, effective policy enforcement, and enhanced public engagement to improve the aesthetic quality of Calabar Metropolis.

Keywords: Municipal waste management, environmental aesthetics, public participation, waste management policies, urban sanitation, Calabar Metropolis.

Introduction and Background
Municipal waste management involves the collection, transportation, treatment, and disposal of waste generated by households, businesses, and institutions (Wilson et al., 2015). Its effectiveness directly impacts environmental cleanliness, sustainability, and aesthetics. Poor waste management results in littering, illegal dumpsites, and pollution, diminishing urban attractiveness (Marešová et al., 2023).

In Nigeria, waste management is hindered by inadequate collection, weak recycling systems, and poor landfill management (Nnaji, 2015). These challenges are exacerbated by weak policy

enforcement, infrastructure deficits, and low public awareness. In Calabar Metropolis, rapid urbanization has led to overflowing waste bins, blocked drainage, and unsightly waste accumulation (Bassey, 2023). Effective waste management is crucial for maintaining environmental aesthetics, which influence social well-being, tourism, and economic activities (Ebejer, 2021). Poor waste disposal fosters visual pollution, pests, and reduced property values (Khanam et al., 2023). This study examines the relationship between waste management and environmental aesthetics in Calabar Metropolis, assessing waste disposal policies and identifying areas for improvement.

Municipal Waste Management and Environmental Aesthetic Quality

Effective waste management sustains the visual appeal of cities, while inefficiencies contribute to environmental degradation (Ofoezie et al., 2022). The Environmental Kuznets Curve (EKC) Hypothesis suggests that environmental degradation initially increases with economic growth but later declines due to improved policies and technology (Grossman & Krueger, 1995). The Broken Windows Theory (Wilson & Kelling, 1982) posits that mismanaged waste fosters urban decay, reinforcing environmental neglect.

Studies in Lagos (Ichipi, 2023) and Accra (Ainooson, 2023) found that poor waste management significantly reduces environmental aesthetics. Research in Nairobi (Otieno, 2023) highlighted the role of recycling in enhancing urban cleanliness. However, findings from Enugu (Onwuzulike & Ezeodili, 2024) suggest urban planning and infrastructure play a more substantial role in aesthetics than waste management.

Despite existing research, gaps remain in understanding how waste management directly affects environmental aesthetics, particularly in African cities. Further studies should integrate subjective perceptions of aesthetics with quantitative assessments to provide a comprehensive understanding of this relationship.

Municipal Waste Management Policies and Environmental Aesthetic Quality

Municipal waste management policies regulate waste collection, disposal, and recycling to maintain urban aesthetics (Keramitsoglou & Tsagarakis, 2018). However, debates persist on their direct impact, as factors like urban planning and community engagement may play a more significant role. The Institutional Theory (Scott, 2005) suggests that well-designed regulations shape environmental quality by enforcing waste standards. The Public Goods Theory (Samuelson, 1954) argues that waste management, as a public good, requires government intervention for proper implementation. The Environmental Kuznets Curve (EKC) Hypothesis

(Grossman & Krueger, 1995) implies that developing cities struggle to implement effective waste policies, affecting urban aesthetics.
Findings on waste management policies and urban aesthetics are mixed. In Lagos, Ichipi (2023) found that strict waste disposal regulations significantly improved aesthetics by reducing littering and illegal dumping. Similarly, Oteng-Ababio et al. (2017) observed that stricter enforcement in Accra resulted in better urban aesthetics.

Conversely, Onwuzulike and Ezeodili (2024) found that while policies improved sanitation in Enugu, they had little effect on aesthetics due to poor infrastructure and compliance issues. This supports the argument that policies alone may be insufficient.

Despite extensive research, gaps remain in understanding the role of cultural and socioeconomic factors in policy implementation (Zhang & Klenosky, 2016). Future studies should adopt mixed-method approaches to explore how waste policies effectively enhance environmental aesthetics in developing cities like Calabar Metropolis.

Public Participation in Waste Management and Environmental Aesthetic Quality
Public participation in waste management involves individuals and communities in waste collection, sorting, recycling, and disposal. Engagement levels depend on socio-economic factors, awareness, and government policies. Wilson et al. (2015) emphasize that community-based waste initiatives improve efficiency and sustainability.

Environmental Aesthetic Quality (EAQ) and Indicators
EAQ refers to visual appeal, cleanliness, and the absence of pollutants (Postell & Gesimondo, 2011). It influences public health, property values, and urban sustainability. Indicators include litter levels, air and water quality, and green space maintenance (Kapinga & Chung, 2020).

The Relationship Between Public Participation and EAQ
Scholars debate whether public participation directly enhances EAQ. Ahmed et al. (2022) argue that greater involvement leads to cleaner environments, while Ghisellini et al. (2016) contend that policies, infrastructure, and enforcement play a more significant role. In Calabar, waste management challenges persist despite public engagement efforts (Agbaji & Ejemot-Nwadiaro, 2019).

Findings on the impact of public participation on EAQ are mixed. Ichipi (2023) found that while community participation in Lagos improved waste segregation, irregular municipal collection limited aesthetic benefits. Adekunle et al. (2012) reported similar issues in Port Harcourt, where illegal dumping undermined participation efforts. Permana et al. (2015) noted

that high participation levels in waste programs did not significantly enhance urban aesthetics due to weak infrastructure and inefficient collection systems.

Existing research suggests that while public participation supports sustainable waste management, it does not significantly improve EAQ. Stronger institutional frameworks and policy enforcement are necessary for lasting aesthetic improvements in Calabar Metropolis.

Statement of the Problem

Municipal waste management remains a major environmental challenge in rapidly growing cities like Calabar Metropolis, Cross River State, Nigeria. Effective waste management is essential for environmental quality, public health, and urban aesthetics. However, poor waste disposal, inefficient collection, and inadequate segregation contribute to environmental degradation and diminish the city's visual appeal.

Despite government policies, indiscriminate dumping, overflowing bins, and littered streets persist, leading to pollution, blocked drainage, and increased health risks. The lack of community participation and awareness in sustainable waste practices further worsens the situation.

The impact of municipal waste on Calabar's environmental aesthetic quality has received limited empirical attention, leaving a gap in understanding how waste management affects urban aesthetics and livability. This study examines the effectiveness of current waste management strategies and their implications for Calabar's aesthetic quality. The findings will offer insights for policymakers, urban planners, and stakeholders on improving waste management to enhance the city's environmental and visual appeal.

Purpose of the Study

The main purpose of this study is to examine Municipal Waste Management and Its Impact on the Environmental Aesthetic Quality of Calabar Metropolis, Cross River State, Nigeria. Specifically, the study seeks to:

1. To examine the relationship between municipal waste management practices and the environmental aesthetic quality of Calabar Metropolis.
2. To assess the impact of municipal waste management policies on the environmental aesthetic quality of Calabar Metropolis.
3. To investigate the extent to which public participation in waste management influences the environmental aesthetic quality of Calabar Metropolis.

Research Hypotheses

1. There is no significant relationship between municipal waste management practices and the environmental aesthetic quality of Calabar Metropolis.
2. Municipal waste management policies have no significant impact on the environmental aesthetic quality of Calabar Metropolis.
3. Public participation in waste management does not significantly influence the environmental aesthetic quality of Calabar Metropolis.

Methodology

This study adopts a correlational research design to examine the relationship between municipal waste management and environmental aesthetic quality in Calabar Metropolis, Cross River State, Nigeria. This design allows for statistical validation of findings without manipulating variables, ensuring objectivity and evidence-based decision-making in urban waste management.

Study Area

Calabar Metropolis, comprising Calabar South and Calabar Municipal Councils, serves as the capital of Cross River State and is often referred to as Nigeria's tourism capital. The city, covering 406 km², had a projected population of 479,329 in 2018 (NPoC, 2018). It features a tropical monsoon climate with temperatures ranging from 21°C to 29°C and an annual rainfall of nearly 3,000 mm. Waste management remains a major challenge, with open dumpsites causing environmental hazards and degrading aesthetic quality.

Population and Sampling

The study population consists of all 479,329 residents of Calabar Municipality (NPoC, 2024). A stratified random sampling technique was employed to select 40 streets out of 246 through a hat-and-draw method. On each street, four respondents were selected accidentally, resulting in a sample size of 200 respondents.

Instrumentation

A researcher-developed questionnaire was used for data collection, divided into two sections:

1. Part A: Demographic data (age, sex, street of residence).
2. Part B: Perceptions of municipal waste management and its impact on environmental aesthetics.

A two-point response scale was used:

- Municipal Waste Management Perceptions:
    - Destroys aesthetic value (DAV) = 1
    - Improves aesthetic value (IAV) = 2

- Public Attitudes Toward Aesthetic Quality:
  - Poor attitudes (PAV) = 1
  - Good attitudes (GAV) = 2
- Environmental Aesthetic Quality:
  - Negative aesthetic value (NAV) = 1
  - Positive aesthetic value (PAV) = 2

Validity and Reliability

The instrument was reviewed by experts in test and measurement and validated by the research supervisor. Reliability was assessed using the split-half method, with 50 copies administered in Odukpani, Cross River State. A Pearson correlation coefficient of 0.78 confirmed the instrument's consistency.

Data Collection and Analysis

The researcher and two assistants administered questionnaires to willing respondents. Data were coded numerically, with scores reversed for negatively worded items, ensuring accuracy in statistical analysis.

Results and discussion

Data analysis was done hypothesis by hypothesis with each hypothesis tested at 0.05 level of significance using Pearson product moment correlation with the aid of SPSS (Special package of social science), followed by discussion of the results.

Ho_1

There is no significant relationship between municipal waste management practices and the environmental aesthetic quality of Calabar Metropolis.

The independent variable is methods of municipal waste management practices while the dependent variable is environmental aesthetic quality. Pearson product moment correlation statistical tool was used for data analysis. The result of this analysis is presented in Table 1.

Table1: Pearson product moment correlation analysis of the relationship Municipal waste management practices and Environmental aesthetic quality (N200).

Variables	Mean	SD	Cal-r	Sign
Municipal waste management practices	10.7400	1.45360	.889**	.000
Environmental aesthetic quality	21.8500	2.45103		

*P< 0.05; df = 198

From Table 1, the correlation coefficient (r) is 0.889, which indicates a strong positive relationship between municipal waste management practices and environmental aesthetic quality. The significance value (p = 0.000) is less than the 0.05 threshold, suggesting that this relationship is statistically significant. Since p < 0.05, the null hypothesis stating that "There is no significant relationship between municipal waste management practices and environmental aesthetic quality" is rejected. The strong positive correlation (r = 0.889) suggests that improved municipal waste management practices are associated with enhanced environmental aesthetics. This finding implies that effective waste management strategies, such as proper collection, disposal, and recycling, significantly contribute to maintaining and improving the aesthetic quality of Calabar Metropolis.

Ho_2

Municipal waste management policies have no significant impact on the environmental aesthetic quality of Calabar Metropolis.

Table 2: Pearson product moment correlation analysis of the relationship between Municipal waste management policies has no significant impact on the environmental aesthetic quality (N200).

Variables	Mean	SD	Cal-r	Sign
Municipal waste management policies	15.9450	4.64433	.079	.000
Environmental aesthetic quality	21.8500	2.45103		

Not significant P< 0.05; df = 198.

From Table 2, the correlation coefficient (r) is 0.079, indicating a very weak positive relationship between municipal waste management policies and environmental aesthetic quality. The significance value (p = 0.000) is below the 0.05 threshold, meaning the result is

statistically significant. However, the extremely low correlation suggests that municipal waste management policies have little to no meaningful impact on environmental aesthetics.

Since r = 0.079, the correlation between waste management policies and environmental aesthetics is weak, meaning policy implementation may not be effectively translating into visible improvements in environmental quality. The statistical significance (p = 0.000) suggests that while the relationship exists, it is not practically significant in influencing environmental aesthetics. These findings imply potential gaps in policy enforcement, public compliance, or infrastructure that hinder effective waste management's impact on environmental aesthetics.

Ho_3

Public participation in waste management does not significantly influence the environmental aesthetic quality of Calabar Metropolis. The independent variable is individual attitudes towards waste management while the dependent variable is environmental aesthetic quality. Pearson product moment correlation analysis statistical tool was used for data analysis. The result of this analysis is presented in Table 3

Table 3: Pearson product moment correlation analysis of the relationship between public participation in waste management and the aesthetics value of the environment. (N200).

Variables	Mean	SD	Cal-r	Sign
Public participation in waste management	19.5200	1.84571		
			.909**	.000
Aesthetics value of the environment	21.8500	2.45103		

*P< 0.05; df = 198.

The study assessed the relationship between public participation in waste management (independent variable) and environmental aesthetic quality (dependent variable) in Calabar Metropolis using the Pearson Product-Moment Correlation Coefficient.

From Table 3, the correlation coefficient (r) is 0.909, indicating a very strong positive relationship between public participation in waste management and environmental aesthetic quality. The significance value (p = 0.000) is below the 0.05 threshold, meaning the relationship is statistically significant.

Since p < 0.05, the null hypothesis stating that "Public participation in waste management does not significantly influence environmental aesthetic quality" is rejected. The strong positive

correlation (r = 0.909) suggests that higher levels of public participation in waste management are strongly associated with improved environmental aesthetics. This finding implies that active community involvement in waste disposal, recycling, and sanitation efforts significantly enhances the aesthetic quality of the environment. The results highlight the importance of fostering public awareness, engagement, and responsibility in waste management to improve urban environmental aesthetics.

Discussion of Findings

Ho_1

The study found a strong positive correlation (r = 0.889, p = 0.000) between municipal waste management practices and environmental aesthetic quality in Calabar Metropolis. This suggests that proper waste collection, disposal, and recycling significantly enhance urban aesthetics.

These findings align with Ichipi (2023), who examined waste management in Lagos, Nigeria, and found that structured waste systems improved both environmental and economic value. Similarly, Ainooson (2023) in Accra, Ghana, highlighted that poor waste disposal habits led to environmental degradation.

Implications of the Findings

1. Enhanced urban aesthetics, making public spaces more visually appealing.
2. Reduced waste-related pollution, benefiting public health and environmental sustainability.
3. Economic benefits, as cleaner environments attract tourism and boost property values.

This study reinforces that effective municipal waste management is crucial for urban environmental planning and policy-making.

Ho_2

The study found a very weak positive correlation (r = 0.079, p = 0.000) between municipal waste management policies and environmental aesthetic quality in Calabar Metropolis. While statistically significant, the low correlation suggests that these policies have minimal practical impact.

Possible Explanations for the Weak Relationship

1. Poor Policy Implementation – Weak enforcement limits effectiveness.
2. Low Public Compliance – Lack of awareness and incentives reduce adherence.

3. Insufficient Waste Infrastructure – Inadequate collection and recycling facilities hinder improvements.
4. Lack of Government Oversight – Weak monitoring and evaluation reduce policy impact.

This contrasts with Ichipi (2023) in Lagos, where strict enforcement of waste policies improved environmental aesthetics. Similarly, Ainooson (2023) in Accra found that stronger policy implementation led to better urban aesthetics.

Implications of the Findings

1. Policy existence alone is insufficient—implementation and enforcement are critical.
2. Stronger institutional frameworks are needed to ensure policy effectiveness.
3. Public participation should be encouraged through education, incentives, and penalties.

The weak correlation suggests that policy effectiveness depends on enforcement, public cooperation, and infrastructure improvements to achieve a cleaner and more visually appealing Calabar Metropolis.

H_{O3}

The study found a very strong positive relationship ($r = 0.909$, $p = 0.000$) between public participation in waste management and environmental aesthetic quality in Calabar Metropolis. This suggests that increased public involvement—such as waste disposal, recycling, and sanitation—significantly enhances environmental aesthetics.

Implications of the Findings

The strong correlation highlights the importance of community-driven waste management in maintaining urban cleanliness. However, its effectiveness depends on government policies, infrastructure, and enforcement mechanisms.

This aligns with Adekunle et al. (2012) in Lagos, who found that waste segregation improved but irregular collection limited aesthetic gains. Similarly, Permana et al. (2015) in Port Harcourt noted that despite residents' willingness to recycle, illegal dumping persisted, reducing environmental appeal. Essien et al. (2021) also found that high public participation in Calabar was hindered by poor infrastructure and inefficient collection systems.

Key Takeaways

1. Public participation alone is insufficient—efficient waste infrastructure is necessary.
2. Irregular waste collection weakens community efforts, limiting aesthetic improvements.
3. A multi-faceted approach combining public engagement, policy enforcement, and infrastructure investment is essential.

This study underscores the role of public participation in waste management but emphasizes that sustainable improvements require government support and effective waste collection systems.

Conclusions & Recommendations

The study revealed that waste management practices and public participation strongly enhance urban aesthetics, while policies alone had minimal impact due to weak enforcement.

Recommendations

1. Improve Waste Collection Systems – Ensure regular waste disposal and invest in recycling facilities.
2. Strengthen Public Awareness – Educate residents on proper waste disposal and the risks of illegal dumping.
3. Enhance Public-Private Collaboration – Foster partnerships between government, private firms, and communities.
4. Enforce Waste Policies – Implement stricter regulations, penalties, and incentives for compliance.

A collaborative approach is essential to achieving a cleaner, more visually appealing, and sustainable Calabar Metropolis.

References

Adekunle, I. M., Oguns, O., Shekwolo, P. D., Igbuku, A. O., & Ogunkoya, O. O. (2012). Assess-ment of population perception impact on value-added solid waste disposal in devel-oping countries, a case study of Port Harcourt City, Nigeria. *Municipal and Industrial Waste Disposal. Intech*, p177-206.

Agbaji, D.D; & Ejemot-Nwadiaro, R.I. (2019). Solid Waste Management in Calabar Metropolis: Case Study of Calabar Urban Development Authority (2008 – 2017). *Greener Journal of Medical Sciences,* 9(1): 17-31, http://doi.org/10.15580/GJMS.2019.1.032919058.

Ahmed, Z., Caglar, A. E., & Murshed, M. (2022). A path towards environmental sustainability: the role of clean energy and democracy in ecological footprint of Pakistan. *Journal of Cleaner Production*, *358*, 132007.

Ainooson, O. (2023). *Rapid Urbanization and its Impact on Municipal Solid Waste Management in the Greater Accra Region of Ghana* (Master's thesis, Auburn University).

Bassey, B. J. (2023). Urban Landuse And Generation Of Solid Waste In Calabar Metropolis, Cross River State, Nigeria. *Global Journal of Social Sciences*, *22*(1), 167-178.

Ebejer, J. (2021). *Tourism in European Cities: The visitor experience of architecture, urban spaces and city attractions*. Rowman & Littlefield.

Engler, M. (2004). *Designing America's waste landscapes*. JHU Press.

Ghisellini, P., Cialani, C., & Ulgiati, S. (2016). A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner production*, *114*, 11-32.

Grossman, G., & Krueger, A. (1995). Economic growth and the environment. *Quarterly Journal of Economics, 110*(2), 353-377.

Ichipi, E. B. (2023). *Assessing the Environmental and Health Impact of Illegal Dumping of Solid Waste in Lagos State*. University of Johannesburg (South Africa).

Ichipi, E. B. (2023). *Assessing the Environmental and Health Impact of Illegal Dumping of Solid Waste in Lagos State*. University of Johannesburg (South Africa).

Kapinga, C. P., & Chung, S. H. (2020). Marine plastic pollution in South Asia.

Kapinga, C. P., & Chung, S. H. (2020). Marine plastic pollution in South Asia.

Keramitsoglou, K. M., & Tsagarakis, K. P. (2018). Public participation in designing the recycling bins to encourage recycling. *Sustainability*, *10*(4), 1240.

Khanam, Z., Sultana, F. M., & Mushtaq, F. (2023). Environmental pollution control measures and strategies: an overview of recent developments. *Geospatial Analytics for Environmental Pollution Modeling: Analysis, Control and Management*, 385-414.

Marešová, D., Mareš, K., Alexiou-Ivanova, T., Satyakti, Y., & Pilařová, T. (2023). Evaluating the waste management situation and attitudes of residents in Bandung, Indonesia. *Integrated Environmental Assessment and Management*, *19*(1), 114-125.

Nnaji, C. C. (2015). Status of municipal solid waste generation and disposal in Nigeria. *Management of Environmental Quality: An International Journal*, *26*(1), 53-71.

Ofoezie, E. I., Eludoyin, A. O., Udeh, E. B., Onanuga, M. Y., Salami, O. O., & Adebayo, A. A. (2022). Climate, urbanization and environmental pollution in West Africa. *Sustainability*, *14*(23), 15602.

Onwuzulike, O., & Ezeodili, W. (2024). Healthcare Imbroglio in Enugu Metropolis: Interrogating Waste Management Efficiency. *NG Journal of Social Development*, *14*(1), 232-247.

Oteng-Ababio, M., Owusu-Sekyere, E., & Amoah, S. T. (2017). Thinking globally, acting locally: formalizing informal solid waste management practices in Ghana. *Journal of Developing Societies*, *33*(1), 75-98.

Otieno, J. A. (2023). *Critical risk factors, external risk factors and performance of building projects in Kenya: a case of Nairobi County* (Doctoral dissertation, Africa Nazarene University).

Permana, A. S., Towolioe, S., Abd Aziz, N., & Ho, C. S. (2015). Sustainable solid waste management practices and perceived cleanliness in a low income city. *Habitat International*, *49*, 197-205.

Pires, A., Martinho, G., & Chang, N. B. (2011). Solid waste management in European countries: A review of systems analysis techniques. *Journal of environmental management*, *92*(4), 1033-1050.

Postell, J., & Gesimondo, N. (2011). *Materiality and interior construction*. John Wiley & Sons.

Samuelson, P. A. (2024). The pure theory of public expenditure. In *Public Goods and Market Failures* (pp. 29-33). Routledge.

Scott, W. R. (2005). Institutional theory: Contributing to a theoretical research program. *Great minds in management: The process of theory development*, *37*(2), 460-484.

Un-Habitat. (2010). *Solid waste management in the world's cities: Water and sanitation in the world's cities 2010*. Routledge.

Wen, Y., Zhao, Y., Guan, Z., & Zhang, X. (2023). Remodeling of Abandoned Land: A Review of Landscape Regeneration and the Reconstruction of Urban Landfill Sites. *Sustainability*, *15*(14), 10810.

Wilson, D. C., Velis, C., & Cheeseman, C. (2006). Role of informal sector recycling in waste management in developing countries. *Habitat international*, *30*(4), 797-808.

Zhang, L., & Klenosky, D. B. (2016). Residents' perceptions and attitudes toward waste treatment facility sites and their possible conversion: A literature review. *Urban forestry & urban greening*, *20*, 32-42.