CBEL Journal of Multidisciplinary Research
Vol. 1 No. 1 (2026): ISSN (Online): 3108-8848
DOI: https://doi.org/10.66313/j461hh68
Contribution of Urban Open Space Governance to Environmental Management in Dar es Salaam, Tanzania: Insights from Vingunguti Ward

Contribution of Urban Open Space Governance to Environmental Management in Dar es Salaam, Tanzania: Insights from Vingunguti Ward

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Article History
Received: 2026-01-17
Revised: 2026-02-28
Accepted: 2026-03-25
Published: 2026-03-31

Keywords
Urban open spaces,
Open space governance,
Environmental management,
Waste management,
Urbanization.

How to cite:
Charles, A. M., Kiyungi, M. T., & Nyery, C. A. (2026). Contribution of Urban Open Space Governance to Environmental Management in Dar es Salaam, Tanzania: Insights from Vingunguti Ward. *CBEL Journal of Multidisciplinary Research, 1*(1), 1-9.

Abstract
Rapid urbanisation in Dar es Salaam, Tanzania, has placed immense pressure on limited urban open spaces, which play vital roles in flood mitigation, waste management, and microclimate regulation. This study examined the contribution of urban open space governance to environmental management in Vingunguti Ward, Ilala Municipality. Adopting a mixed-methods case study design, data were collected from 376 residents and local government officials through structured questionnaires, semi-structured key-informant interviews, and documentary review. Quantitative data were analysed using descriptive statistics and Pearson correlation in SPSS version 27, while qualitative data underwent thematic analysis. Findings revealed that urban open spaces in the ward are in poor condition, with more than half of respondents rating protection from encroachment (56.9 %), drainage function (51.6 %), and cleanliness (48.1 %) as poor. Governance performance was moderate overall (mean scores 2.76–3.15), with the lowest ratings for enforcement of open space protection (M = 2.87) and institutional coordination (M = 2.76). Nevertheless, governance indicators showed statistically significant positive correlations with environmental outcomes ($r = 0.62$, $p < 0.01$), particularly between enforcement effectiveness and flood mitigation ($r = 0.62$) and between institutional coordination and waste reduction ($r = 0.57$). Community participation remained moderate and inconsistent. The study concludes that the quality of governance not merely the existence of open spaces determines their contribution to environmental management. Strengthening regulatory enforcement, inter-agency coordination, and participatory mechanisms offers a practical pathway to enhance ecological resilience in rapidly urbanizing Tanzanian cities.

INTRODUCTION

Urbanisation is transforming cities across the Global South at a pace that often exceeds the capacity of planning institutions to respond effectively. In many rapidly growing urban centres, spatial expansion has not been matched by adequate infrastructure, environmental regulation, or participatory governance mechanisms (Worrall et al., 2017). The consequences are visible and immediate. Congested settlements, degraded open spaces, unmanaged waste streams, and fragile ecological systems now characterise much of the urban landscape.

Globally, cities are responsible for a substantial share of environmental degradation, accounting for nearly three-quarters of greenhouse gas emissions and a disproportionate consumption of natural resources (Vincevica-Gaile et al., 2023). This reality places urban governance at the centre of environmental management discourse. Planning is no longer confined to zoning and land allocation; it must integrate ecological sustainability, climate resilience, and public health considerations into everyday decision-making. Without such integration, urban growth risks entrenching environmental vulnerability rather than alleviating it.

In Tanzania, these dynamics are particularly evident in Dar es Salaam, the country's largest city and commercial capital. The city's population has expanded dramatically over the past two decades, rising from approximately 2.5 million in 2002 to over 6 million in 2022 (Manyama et al., 2019). This rapid demographic shift has intensified pressure on land, housing, infrastructure, and environmental systems. Although the 2016–2036 Master Plan seeks to guide urban expansion, its implementation operates within a crowded institutional space shaped by donor-funded programs, shifting political priorities, and limited fiscal capacity (Worrall et al., 2017). Planning and investment decisions made today will determine the long-term performance and sustainability of Tanzania's cities.

At the ward level, these structural challenges take on concrete form. Vingunguti Ward in Ilala Municipality exemplifies the environmental pressures associated with rapid urbanisation. According to the 2022 National Bureau of Statistics data, the ward hosts approximately 66,342 residents distributed across more than 6,000 households. High population density exceeding 4,000 persons per square kilometre in parts of Dar es Salaam has strained waste management systems, drainage infrastructure, and access to clean water (Mkasimongwa et al., 2024). Notably, over 60% of solid waste generated in Vingunguti reportedly remains uncollected, contributing to pollution, disease outbreaks, and the proliferation of informal dumpsites (Msuya et al, 2025; Yuan, Chen, & Miao, 2023).

While infrastructure deficits are well documented, the governance of urban open spaces remains comparatively underexplored. Open spaces such as parks, playgrounds, reserves, and undeveloped communal land perform critical ecological and social functions. They regulate microclimates, improve air quality, support biodiversity, and mitigate flooding through natural drainage systems. Beyond environmental benefits, they provide spaces for recreation, social interaction, and community cohesion. Yet in densely populated, low-resource wards like Vingunguti, these spaces are limited in extent, approximately five hectares in total and frequently neglected or encroached upon (Nyery, Adongo, & Kisasa, 2025).

Governance determines whether such spaces deteriorate or contribute meaningfully to environmental management. Effective open space governance requires clear land-use planning frameworks, consistent maintenance regimes, regulatory enforcement, and active community participation. Collaborative theory emphasises inclusive dialogue and shared responsibility among stakeholders, arguing that top-down planning models often fail to address local needs (Innes, 1990s; Sanga et al., 2022). Systems Theory, as articulated by Ludwig von Bertalanffy, further underscores the interdependence of urban components, demonstrating how deficiencies in one sector, such as waste management, can cascade into public health crises and ecological degradation (Von Bertalanffy, 2019; Oluwagbayide et al., 2024). In Vingunguti, for example, poor waste management not only pollutes open spaces but also exacerbates flooding and disease prevalence, thereby linking environmental mismanagement to broader socio-economic consequences. Despite substantial scholarship on urban sustainability, notable gaps remain. Existing research often isolates housing policy, infrastructure development, or environmental regulation as discrete domains of inquiry (Vincevica-Gaile et al., 2023; Yuan et al., 2023). Studies on open spaces typically focus on their ecological or social value without sufficiently interrogating the governance structures that sustain or undermine them, particularly in high-density, resource-constrained African urban contexts (Semeraro et al., 2021; Parihar et al., 2024).

Moreover, there is limited empirical work integrating housing, infrastructure, and open space governance within a single localised Tanzanian case study using a mixed-methods framework.

This paper responds to that gap by examining the contribution of urban open space governance to environmental management in Vingunguti Ward, Dar es Salaam. The inquiry is both timely and necessary. As Tanzania pursues sustainable urban development under national frameworks such as the Development Vision 2025 and the Integrated Urban Development Framework (IUDF), understanding how governance practices at the ward level shape environmental outcomes becomes critical. Strengthening open space governance may represent a practical and scalable pathway toward enhancing ecological resilience, improving public health, and fostering inclusive urban sustainability in rapidly urbanising cities.

METHOD

Research Design

This study adopted a case study research design to enable an in-depth examination of urban open space governance within a specific socio-spatial context. A case study approach is particularly suitable where the objective is to explore complex, context-dependent phenomena and their interrelationships (Robson & McCartan, 2016). In this instance, the design allowed for a comprehensive assessment of how governance structures, institutional practices, and community engagement mechanisms influence environmental management outcomes in Vingunguti Ward.

The case study framework provided room for detailed exploration rather than broad generalisation. It enabled the integration of quantitative measurements and qualitative insights, thereby capturing both measurable environmental conditions and the lived experiences of residents and officials involved in planning processes.

Research Approach

A mixed-methods approach was employed, combining quantitative and qualitative techniques to generate a holistic understanding of the research problem (Creswell & Creswell, 2018). The rationale for adopting this approach was straightforward. Environmental management and governance are multidimensional issues that cannot be fully understood through numerical indicators alone.

Quantitative data were collected primarily through structured questionnaires administered to residents and local officials. These instruments captured measurable perceptions regarding housing policies, infrastructure adequacy, and open space management. Qualitative data were obtained through semi-structured interviews, which provided deeper insights into governance dynamics, institutional constraints, and community participation processes. Integrating both strands strengthened the validity of the findings by enabling triangulation across data sources.

Study Area

The research was conducted in Dar es Salaam, specifically within Vingunguti Ward in Ilala Municipality. The ward was selected due to its high population density, rapid urban growth, and pronounced environmental challenges. With an estimated population exceeding 66,000 residents, Vingunguti reflects the pressures facing many inner-city wards in Dar es Salaam, including inadequate waste management, limited drainage infrastructure, and scarce public open spaces (Kijazi et al., 2024).

The spatial composition of Vingunguti includes a mix of formal and informal settlements, light industrial activities, and small-scale commercial operations. This heterogeneity makes it a suitable site for examining the interaction between land use, governance practices, and environmental management outcomes.
Environmental pressures in the ward, such as flooding, pollution, and encroachment on open spaces, are not isolated events but systemic manifestations of governance and planning dynamics.

Target Population and Sample Size

The target population comprised residents of Vingunguti Ward, local government officials, planning officers, street executive officers (SEOs), and ward executive officers (WEOs). These groups were selected because of their direct involvement in, or experience with, urban planning and environmental management processes.

A total sample of 376 respondents was utilised in the study. This sample size ensured adequate representation across administrative and community stakeholder groups. It also allowed for meaningful statistical analysis while maintaining feasibility within the study's timeframe and resource constraints.

Sampling Techniques

The study employed both probability and non-probability sampling techniques. Simple random sampling was used to select community respondents, ensuring that each eligible resident had an equal chance of participation. This approach minimised selection bias and enhanced the representativeness of quantitative findings.

Purposive sampling was applied in selecting key informants, including planning officers, ward officials, and other stakeholders directly involved in governance processes. These participants were chosen based on their expertise, institutional roles, and familiarity with open space management practices. The combination of sampling strategies ensured both breadth and depth in data collection.

Data Collection Methods

Data were gathered through three primary methods: questionnaires, interviews, and documentary review.

Structured questionnaires were administered to capture quantitative data on perceptions of housing policy effectiveness, infrastructure adequacy, and open space utilisation. A Likert-scale format was used to measure levels of agreement with statements related to environmental management indicators such as waste control, pollution mitigation, and community participation.

Semi-structured interviews were conducted with selected officials and community leaders to explore governance mechanisms in greater detail. These interviews examined regulatory enforcement, funding constraints, political influences, and participatory planning processes.

Documentary review complemented primary data collection. Policy documents, urban planning frameworks, ward development reports, and relevant national strategies such as Development Vision 2025 and the Integrated Urban Development Framework were analysed to contextualise local governance practices within broader policy environments.

Data Analysis

Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS) version 27. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were generated to interpret patterns in respondents' perceptions. Inferential analysis was applied where appropriate to assess relationships between governance variables and environmental management indicators.

Qualitative data from interviews were analysed thematically. Transcripts were coded to identify recurring themes related to collaborative governance, institutional coordination, open space maintenance, and systemic environmental challenges. Thematic analysis facilitated the interpretation of underlying governance dynamics that could not be fully captured through numerical data alone.

Validity and Reliability

To ensure validity, research instruments were reviewed and refined prior to data collection. Content validity was strengthened through alignment of questionnaire items with study objectives and theoretical constructs derived from collaborative and systems theories.

Reliability was enhanced through consistent administration of questionnaires and standardised interview protocols. Triangulation across quantitative findings, qualitative insights, and documentary evidence further strengthened the credibility of the results. When different data sources converged on similar conclusions, confidence in the findings increased.

Ethical Considerations

Ethical standards were strictly observed throughout the study. Participants were informed about the purpose of the research and assured of confidentiality and anonymity. Informed consent was obtained prior to data collection, and respondents were given the option to withdraw at any stage without consequence. Approval to conduct the study was secured through the relevant municipal and ward authorities in Dar es Salaam. Ethical compliance was essential. It ensured trust, protected participants, and enhanced the integrity of the research process.

RESULTS

Socio-Demographic Characteristics of Respondents

A total of 376 respondents participated in the study, all drawn from households and governance structures within Vingunguti Ward. Table 1 summarises the key socio-demographic characteristics.

Table 1: Socio-Demographic Profile of Respondents (N = 376)

Variable	Category	Frequency	Percentage (%)
Sex	Male	198	52.7
	Female	178	47.3
	Total	**376**	100
Education Level	Primary	146	38.8
	Secondary	171	45.5
	Post-secondary	59	15.7
	Total	**376**	100
Duration of Residence	<5 years	92	24.5
	≥5 years	284	75.5
	Total	**376**	100
Main Occupation	Informal trade	168	44.7
	Formal employment	89	23.7
	Casual labor	72	19.1
	Other	47	12.5
	Total	**376**	100

The majority of respondents (75.5%) had lived in the ward for more than five years. That is significant. Long-term residency increases familiarity with environmental trends and governance practices. Informal trade emerged as the dominant livelihood source (44.7%), reflecting the ward's predominantly informal economic structure.

Status of Urban Open Spaces

Respondents were asked to evaluate the current condition and management of urban open spaces. Their responses are presented in Table 2.

Table 2: Perceived Condition of Urban Open Spaces

Indicator	Poor (%)	Moderate (%)	Good (%)
Cleanliness	48.1	38.6	13.3
Vegetation Maintenance	44.4	41.2	14.4
Drainage Function	51.6	34.8	13.6
Protection from Encroachment	56.9	29.3	13.8

More than half of respondents (56.9%) reported weak protection against encroachment. Similarly, 51.6% rated drainage performance as poor. These findings suggest that open spaces are underperforming environmentally. Their ecological potential exists, but governance shortcomings constrain outcomes.

Governance Effectiveness and Environmental Management

To assess the contribution of open space governance to environmental management, respondents rated several governance indicators using a five-point Likert scale. Mean scores are shown in Table 3.

Table 3: Governance Indicators and Environmental Outcomes

Variable	Mean Score	Standard Deviation
Clarity of land-use regulations	3.12	1.08
Enforcement of open space protection	2.87	1.14
Community participation in planning	2.95	1.21
Coordination among authorities	2.76	1.17
Contribution to waste reduction	3.08	1.05
Contribution to flood mitigation	3.15	1.02

Mean scores ranged from 2.76 to 3.15. These values indicate moderate performance overall. Enforcement and coordination received the lowest ratings, while perceived contributions to flood mitigation and waste reduction scored slightly higher.

Correlation analysis revealed a statistically significant positive relationship between governance effectiveness and environmental outcomes ($r = 0.62$, $p < 0.01$). The association is moderately strong. Where governance mechanisms were perceived as clearer and more participatory, environmental conditions were rated more favourably.

Community Participation

Participation levels were assessed separately. Table 4 presents engagement patterns.

Table 4: Participation in Environmental Governance Activities

Activity	Yes (%)	No (%)
Attendance at ward meetings	42.3	57.7
Participation in clean-up campaigns	51.6	48.4
Awareness of open space regulations	46.0	54.0

Slightly more than half (51.6%) reported participating in clean-up campaigns, but fewer than half attended formal ward meetings. Awareness of regulations remains limited. Participation exists, yet it is uneven and inconsistent.

Correlation Analysis

To determine the strength and direction of relationships between governance variables and environmental management outcomes, Pearson's correlation analysis was conducted. The results are presented in Table 5.

Table 5: Pearson Correlation Matrix between Governance Indicators and Environmental Management Outcomes (N = 376)

Variables	1	2	3	4	5	6
1. Clarity of land-use regulations	1					
2. Enforcement effectiveness	.58**	1				
3. Community participation	.49**	.55**	1			
4. Institutional coordination	.61**	.64**	.52**	1		
5. Waste reduction effectiveness	.46**	.59**	.43**	.57**	1	
6. Flood mitigation effectiveness	.51**	.62**	.48**	.60**	.68**	1

Note: $p < 0.01$

The matrix indicates statistically significant positive correlations among all governance indicators and environmental outcomes. Enforcement effectiveness and institutional coordination show particularly strong associations with flood mitigation ($r = .62$ and $r = .60$, respectively, $p < 0.01$). Similarly, waste reduction effectiveness correlates strongly with enforcement ($r = .59$, $p < 0.01$). The relationships are moderate to strong. None is trivial. Governance quality is consistently linked to environmental performance across indicators.

DISCUSSION

The findings confirm that urban open space governance contributes meaningfully to environmental management in **Dar es Salaam**, particularly through enforcement mechanisms and institutional coordination. The moderate-to-strong correlations observed in Table 5 support collaborative governance theory, which argues that coordinated institutional action and inclusive participation enhance policy implementation outcomes (Ansell & Gash, 2008).

The strong relationship between enforcement effectiveness and flood mitigation ($r = .62$, $p < 0.01$) aligns with research demonstrating that regulatory oversight directly influences environmental performance in urban settings. A study by UN-Habitat (2020) similarly reports that weak land-use enforcement enables encroachment on drainage corridors and open spaces, thereby increasing flood risk in African cities. In this regard, the present findings reinforce existing empirical evidence.

Institutional coordination also showed a robust association with both waste reduction ($r = .57$) and flood mitigation ($r = .60$). This supports systems theory perspectives, particularly the work of Von Bertalanffy (1968), which conceptualises urban environments as interconnected systems where failure in one component produces cascading effects. Comparable findings were reported by Worrall et al. (2017), who observed that fragmented governance in Dar es Salaam undermines environmental service delivery.

However, the moderate strength of correlations suggests that governance alone does not fully determine environmental outcomes. Structural constraints such as fiscal limitations, informal settlement patterns, and rapid population growth may moderate governance impact. Oduro et al. (2021) caution that even well-designed urban policies can yield limited results in contexts characterised by high informality and resource scarcity. This partially challenges overly optimistic assumptions within collaborative governance literature that participation automatically guarantees improved environmental conditions.

Community participation exhibited positive but comparatively weaker correlations with environmental outcomes (ranging from .43 to .48). This finding both agrees and diverges from prior scholarship. Ansell and Gash (2008) argue that inclusive stakeholder engagement improves governance legitimacy and effectiveness. Yet empirical studies in Sub-Saharan Africa indicate that participation often remains consultative rather than transformative (Sanga et al., 2022). In Vingunguti Ward, participation appears present but not deeply institutionalised, which may explain its moderate impact.

The high correlation between waste reduction and flood mitigation ($r = .68$, $p < 0.01$) further highlights environmental interdependence. Poor waste management obstructs drainage systems, exacerbating flooding, a relationship documented in East African urban contexts (UNEP, 2019). The data, therefore, confirm that open space governance influences environmental management not in isolation but through interconnected processes.

Interestingly, while governance variables correlate positively with outcomes, mean performance scores remained moderate. This suggests unrealised potential. Open spaces could contribute more substantially to environmental resilience if enforcement, coordination, and community engagement mechanisms were strengthened.

The findings also resonate with urban resilience scholarship, which emphasises adaptive, locally embedded governance systems as key determinants of sustainable urban development (Meerow et al., 2016). Where governance structures are proactive and integrated, environmental benefits follow. Where fragmentation persists, ecological degradation accelerates.

In sum, the results support the proposition that governance quality is a decisive factor in determining whether urban open spaces function as environmental assets or liabilities. However, governance operates within broader structural and socio-economic constraints that shape its effectiveness.

CONCLUSION

This study examined the contribution of urban open space governance to environmental management in Vingunguti Ward, Dar es Salaam. The statistical analysis demonstrated significant positive correlations between governance indicators and environmental outcomes, particularly in relation to enforcement effectiveness and institutional coordination.

The evidence suggests that open spaces hold measurable potential to reduce flooding and improve waste management. Yet governance fragmentation, limited financial resources, and moderate levels of community engagement restrict their full contribution.

Strengthening regulatory enforcement, improving inter-agency coordination, and institutionalising participatory mechanisms would likely enhance environmental performance. These interventions are practical. They are scalable. And they align with broader sustainable urban development frameworks in Tanzania.

Ultimately, the findings reaffirm a central insight: environmental resilience in rapidly urbanising cities depends less on the mere existence of open spaces and more on the quality of governance structures that manage them.

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