

Dissertation

Evaluating the Impact of Urbanization on Waste Management Systems: A Case Study of Kinondoni District, Dar es Salaam, Tanzania

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Evaluating the Impact of Urbanization on Waste Management Systems: A Case Study of Kinondoni District, Dar es Salaam, Tanzania

By Faraja Shabani Kirubi

"This thesis is submitted for the Master of Arts in International Social Work and Community Development degree at the University of Central Lancashire in partial fulfillment of the academic requirements."

April 2025

DECLARATION

I, Faraja Shabani Kirubi, do hereby declare that this dissertation titled: Evaluating The Impact of Urbanization on Waste Management in Kinondoni District, Dar es Salaam, Tanzania, submitted for the award of MA International Social Work and Community Development, at the University of Central Lancashire (UCLan), is my own work and has not been submitted, in whole, or in part, for any other degree or diploma at this or another institution.

I confirm that:

1. All sources of information and references have been fully acknowledged and cited according to academic standards.
2. No part of this dissertation has been copied or plagiarized from other sources unless explicitly stated and appropriately referenced.
3. This work is entirely the result of my own effort, except where due acknowledgment is made.

I understand that any breach of this declaration may result in disciplinary action as per the university's academic regulations.

Signed: Faraja Shabani Kirubi

Date: 03 April 2025

ABSTRACT

The rapid urbanization in Kinondoni District, Dar es Salaam, has changed the socio-economic and environmental dynamic of the area significantly, leading to greater challenges in waste management systems. Focusing on population growth, economic opportunities, governance structures, and community participation, this study critically explored the complex links between urbanization and waste management in Kinondoni. The study employed qualitative research methods including semi-structured interviews, focus group discussions, and direct observations to engage diverse stakeholders, including municipal officials, community leaders, and residents. The data analysis uncovered underlying themes: (i) an explosion in waste generation, (ii) inefficient waste management infrastructure; and (iii) governance challenges, particularly in the rapidly urbanising landscape. The findings revealed that Kinondoni's high population growth rate and the prevalence of informal settlements and overcrowding have worsened the waste management problems as a result of inadequate urban planning and limited access to waste collection services. The bulk of uncontained waste is from economic operations, mainly from markets and the informal sector, with plastic waste forming the majority of the waste stream. In addition to this, changing consumption patterns toward disposables have also aggravated waste generation. One big step was finding many systemic problems with Kinondoni's waste management infrastructure. The government's plan for substantial investment in infrastructure is not timely given irregular waste collection, a lack of modern processing facilities, and poorly managed landfill sites. Weak inter-agency coordination, inconsistent policy enforcement, and governance gaps in dealing with waste hamper the sustainability of existing strategies. Community engagement in waste segregation and recycling is limited, resulting in further unsustainable practices, even when grassroots movements provide strong proof of concept that these can be scalable solutions. However, promising interventions based on community-driven initiatives like composting projects and waste segregation programmes show potential for transformative change. It calls for integrated, multi-stakeholder approaches, drawing on lessons from cities such as Kigali in Rwanda and Curitiba in Brazil that have successfully tackled similar issues at scale. These methods support greater financial investment through public-private partnerships and to closely engage communities in activities to address Kinondoni's waste management challenges holistically. The study also highlights systemic weaknesses in Kinondoni's waste management system. This research reveals that the urbanization rate significantly exceeded the waste removal capacity by traditional means in Kinondoni District. The infrequent collection of waste, the absence of modern waste processing facilities, inefficient garbage pickup schedules, insufficient funding, and lack of community awareness and initiatives, leading to environmental hazards such as blocked drains and increased disease outbreaks, also the mismanaged landfills highlight the need for infrastructural investment. The results highlight the critical need for policy changes, institutional

capacity-building, and innovative financial models to strengthen waste management systems. Kinondoni can pave the way for such a waste management model, transitioning toward a sustainable waste management model will require the addressing of systemic barriers and cross-organization collaboration among stakeholders to overcome systemic barriers that hinder waste recovery in emerging markets and reduce environmental degradation, improve public health, and unlock economic opportunities. This research enriches and adds to the wider conversation around sustainable cities, providing valuable guidelines and practical recommendations for policymakers, urban planners, and practitioners in the development sector aiming to reconcile and balance urban expansion environmental resilience.

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ACRONYMS

ARU	Ardhi University
EEA	European Environmental Agency
FGD	Focus Group Discussion
GDP	Gross Domestic Product
IPCC	Intergovernmental Panel on Climate Change
MWM	Municipal Waste Management
NBS	National Bureau of Statistics
NEMA	National Environmental Management
NGOs	Non-Governmental Organizations
PPP	Public-Private Partnership
SDGs	Sustainable Developmental Goals
SMES	Small & Medium Scales Enterprises
URT	United Republic of Tanzania
UN	United Nation
UNEP	United Nation Environmental Programme
WHO	World Health Organization

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Faraja Shabani Kirubi

Introduction

This chapter introduces the study, including the background, research problem, objectives, significance, scope, and structure of the thesis.

1.1 Overview

Urbanization has become one of the most evident forces that shape the economic and social landscape, especially in developing countries, such rapid urban growth is providing prospects in the economy but also poses significant threats in Tanzania, particularly waste generation (Worrall *et al.*, 2017). Tanzania's largest city, Dar es Salaam, exemplifies this paradox. Increasing urban infrastructure and services demand, paired with demographic growth, including waste management systems have been experienced in the city's Kinondoni District during the past decades (Todd *et al.*, 2019). Nevertheless, poor planning, insufficient resources, and lack of awareness among community members have complicated the problem of waste management, putting both the environment and the health of the population at risk (Shekdar, 2009; Mukherjee *et al.*, 2020). This study elaborates on the effects that urbanization has on Kinondoni District waste management systems in terms of population growth, infrastructure development challenges, and governance. The study seeks to fill the gaps and devise solutions based on evidence by analysing the efficiency of existing waste management practices.

1.2 Background of the problem

The movement of people from low-density rural areas to densely populated urban centres can be a blessing and a curse to a city in the developing world. Although it promotes economic growth, it creates a lot of stress on urban infrastructure such as waste disposal systems (UN-Habitat, 2020). Urbanization in Tanzania increased from 25.6% in 2012 to over 34% in 2022 with an impressive amount of this growth from Dar es Salaam alone (NBS, 2022). Kinondoni District being among the most populated in the city of Dar es salaam is severely challenged by the amount of waste produced by the residents (UN-Habitat, 2020). The inability of the state of Tanzania and its waste management systems to effectively manage this crisis is further compounded by the increasing proliferation of informal settlements across the country, ineffective waste collection systems, and poor waste disposal methods (Kabera *et al.*, 2021). For instance, Dar es Salaam only collects 40% of the waste-producing population, and 60% leaves the waste in open space, which blocks waterway drains and becomes a breeding ground for diseases (Mollel & Chaggu, 2021). This highlights the critical importance of assessing waste management systems in the urbanization context. With the complexity of operating in urban environments, a multi-stakeholder approach, including the government (the

municipal authority), the private sector players, and local communities is needed to tackle urban waste (Simon, 2008). However Kinondoni has suffered from weak governance structures and limited community participation (Mollel & Chaggu, 2021). Despite the government issuing policies like the National Environmental Management Act (2004) and the Sustainable Solid Waste Management Strategy (2018), their implementation is faltering in practice, mostly because the majority of the population is not educated on the policies and there are limited resources for enforcement (URT, 2018). Engagement of communities is another important aspect because this helps in creating ownership and accountability in solid waste management practices. However, studies suggest that public participation in Kinondoni is low and the majority of residents are unaware of their roles in sustainable waste management practices (Kabera *et al.*, 2021). It further underlines the importance of stronger governance structures and a higher level of community buy-in to achieve waste management success (URT, 2018).

1.3 Research Problem

Rapid urbanization in both the Kinondoni District and beyond has overwhelmed the current waste management capacity, contributing to environmental degradation and public health crises (NBS, 2022). The district produces about 2500 tons of waste per day, but unfortunately, there is no proper infrastructure and resources to manage this waste (World Bank, 2020). These range from inadequate waste collection coverage in the cities to poorly managed landfill site control in urban communities. Weak governance, insufficient funding, and a low level of public awareness compound these issues, forming a vicious cycle of inefficiency and neglect (UN-Habitat, 2020). In addition, little collaboration among stakeholders such as various government agencies, private haulers, and local communities also inhibits action (NBS, 2022). This mismanagement can waste opportunities and create pests for the city, like increasing environmental hazards and health hazards, turning Kinondoni into a category of undesirable settlement that cannot adapt into a smart city with effective urban governance.

1.3.1 Research Questions

1. What is the relationship between urbanization and waste generation in Kinondoni District?
2. How well are current waste handling facilities prepared for this upward trend?
3. How do governance and community participation improve waste management in Kinondoni District?

1.3.2 Research Objectives

1. To examine the relationship between urbanization and waste generation in Kinondoni District.

2. To assess the effectiveness of current waste disposal systems and mechanisms.
3. Examine governance and community involvement in sanitation and waste management.

1.4 Significance of study

The key objective of this research is to track the information available in waste management systems and fill the gaps to shape evidence-based policies and interventions to match gaps in infrastructure, governance, and community engagement. This research also adds to the wider conversation around sustainable urbanization and its potential to address key challenges of environmental and public health, highlighting the importance of successful waste management as a crucial aspect of a sustainable urban future. Moreover, this study contributes to global sustainability agenda, such as the United Nations Sustainable Development Goals (SDGs), specifically Goal 3 (Good Health and Well-Being), Goal 6 (Clean Water and Sanitation) Goal 11 (Sustainable Cities and Communities), Goal 12 (Responsible Consumption and Production), and Goal 13 (Climate Action). Designed to address waste management challenges facing Kinondoni, the study offers insights relevant to other rapidly urbanizing situations within developing countries.

1.5 Structure of the Dissertation

The dissertation is introduced in five chapters. Chapter One is the Introduction, which discusses the research problem, objectives, and significance of the study. Chapter Two provides a mantra of what empirical literature is available on the subject of urbanization and waste management, and outlines some of the theoretical frameworks used in prior studies. Chapter Three describes the research method (data collection and analysis techniques). Chapter Four includes findings and their implications for waste management in Kinondoni. Chapter Five wraps up the study, and provides recommendations for policy, practice, and further research.

1.5 Conclusion

The rapid urbanization provides opportunities as well as challenges for most developing cities with waste management being a vital issue coming to the fore. As a result, the rapid population growth in Kinondoni District has exceeded available waste management system capacity, leading to high risks to environmental sustainability and public health. The purpose of this study is to assess urbanization effects on waste management systems in Kinondoni and develop evidence-based recommendations for policies and initiatives. Through tackling these challenges, the research contributes towards the broader aim of promoting sustainable urban development in the country of Tanzania.

1.6 Scope and Limitation of the Study

The scope of the study is confined to Kinondoni District and therefore might not reflect the heterogenic contexts of waste management problems and dynamics for the rest of the other districts of Dar es Salaam and other regions of Tanzania.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This chapter provides a detailed review of the relevant literature and explores the key theories, concepts, and empirical studies that inform and contextualize the research topic.

2.1 Overview

As the world is urbanizing rapidly, cities are coping with both challenges and opportunities, especially with waste management. Tanzania is one of several developing nations across the world, and these countries are on the cusp of rapid urbanization, which will have serious consequences for infrastructure, environmental sustainability, and public health. "Literature on waste highlights issues in managing waste from growing urban populations. Poor infrastructure, obsolete systems, weak governance, and limited public involvement have been shown to contribute to an increasingly difficult waste-management context in urban environments (Kassim, 2018; Mugo, 2019; Mwangi, 2020; Olawale, 2021). As research on urban waste management continues to grow, there remains a gap in knowledge on the nature of waste management in different cities and districts, including Kinondoni District in Dar es Salaam, (Kassim, 2018). To achieve this, this literature review assesses theoretical backgrounds, conceptualization, and empirical conditions to map out the state of knowledge regarding the mechanisms underlying urbanization and waste management, highlighting governance and community participation and engagement as moderating factors.

2.2 Conceptual Definitions

Urbanization is the process where the population migrates and grows to settle in urban areas replacing the rural outskirts, this transformation is often accompanied by dramatic shifts in land use, economic activity, and infrastructure requirements, including waste management (UN-Habitat, 2020). The independent variable is the level of urbanization in this study, which affects both waste generation and waste management efficiency. **MWM (Municipal Waste Management)** refers to the efficiency of systems and practices in collecting, treating, recycling, and disposing of waste (Mugo, 2019). It is the outcome of this study representing the capacity of infrastructure and regulations to handle the waste produced (Marshall & Farah bakhsh, 2013). **Governance Mechanism:** The institutional structures, policies, and regulations that influence waste management (Olawale, 2021). Good governance not only allows the coordination of stakeholders but also the implementation of policies for a sustainable solution to be reached (Simon, 2008). **Community Participation:** This is letting local residents to be involved in any process in the

waste management system, for instance in waste sorting, recycling, disposal, etc. (Kassim, 2018). **Community engagement** creates ownership and accountability, which helps in the sustainability of waste management practices (Mugo, 2019).

2.3 Theoretical Framework

2.3.1 Urban Ecology Theory

The Theory of Urban Ecology lends itself to this as it recognises that urbanization is a self-organizing process that interacts intimately with ecological systems including waste systems (Olawale, 2021). Such a theory is necessary to understand how urban growth uniquely affects and interacts with both natural and built environments, and, consequently, the challenges and opportunities of sustainable urban development (Marshall & Farahbakhsh, 2013). Adaptive systems that simultaneously incorporate environmental, social, and economic dimensions are central to Urban Ecology and to offering solutions to urban problems (Simon, 2008). For instance, the cause-and-effect theory, which observes the tension between urbanization and ecological systems, is an appropriate theory to use in the context of waste management (Olawale, 2021). Data Used: As this framework is theoretical, my exposure to data and the context behind Kinondoni District influenced its formation.

2.4 Empirical Literature Review

2.4.1 Urbanization and Waste Generation

The volume of waste generated has been rising alongside rapid urbanization, especially in developing countries. Urbanization is one of the greatest contributors to waste generation, and developing urban populations are facing a massive challenge from the growing amount of waste in cities, particularly in Africa. The study conducted by Kassim (2018) reveals the fast urbanization process in African cities has resulted in multiple waste generation which is mostly beyond the reach of existing waste management systems. Urban sprawl in Nairobi has led to serious pressures on waste management systems, and performance causing environmental degradation and public health challenges (Mwangi, 2020). For Lagos, Olawale (2021) noted that the outdated solid waste collection systems have failed to meet the city's growth. This is part of a larger narrative unfolding across many African urban agglomerations where infrastructure and services fail to keep up the pace with the needs of city dwellers (Kassim (2018) . Such findings may indicate the necessity for innovative solutions to contend with waste management pitfalls that may dampen growth in rapidly urbanizing cities. Governance is a key determinant in the efficiency of waste management systems. According to Mugo (2019), waste management is mostly organized around governance and community participation. Robust governance mechanisms are necessary to coordinate stakeholders, enforce waste management policies, and allocate resources for infrastructure and service improvements (Mwangi, 2020). Weak governance

structures have impeded progress in waste management, policy enforcement has been inconsistent, and insufficient investment in infrastructure has limited development (Kennedy *et al.*, 2021). Research shows the importance of good governance frameworks to tackle these issues, with some proposals such as implementing evidence-based policies and integrating private sector actors in waste management (World Bank, 2020; Kabera *et al.*, 2021). The sustainability of waste management systems relies on community participation (Kabera *et al.* 2021). The existing literature has concluded that any practice of waste management would be for naught without public participation in the processes of waste management, including waste sorting and recycling (Kennedy *et al.*, 2021). On the other hand, findings indicate that the extent of public awareness and participation is still limited in many developing cities, including Dar es Salaam in Kinondoni District, low community involvement has been an obstacle, with very few people knowing what waste management is, and why it is essential for the sustainability of their environment (World Bank, 2020). Loosely translated as “It is in a rubbish can but not in rubbish; and ‘rubbish’ why do you have no place in it!” (Mollel & Chaggu, 2021). While some past studies documented waste management issues in Tanzania, only very few paid special attention to Kinondoni District. Previous studies have shown problems like inadequate waste collection services, poor recycling efforts, and lack of maintenance of landfill sites that are aggravated by bad governance and low public awareness (URT, 2018). For instance, in a recent study, Mollel and Chaggu (2021) found that just 40% of the waste generated in Dar es Salaam was collected, with the remaining 60% left unbounded and presenting potential environmental and health hazards. Those results highlight that Kinondoni District would benefit most from investing in better governance frameworks and improving community participation through targeted interventions.

2.5 The gap in Literature and Contribution

Although existing studies contribute to the comprehension of waste management issues in urban areas, specific dynamics related to Kinondoni District still require investigation. Many studies address urban issues citywide but not for individual districts; others view solid waste management in general. They note but do not address the complex nature of rapid urbanization. In attempting to fill this gap, this study investigates the interaction of urbanization and waste management in Kinondoni District, specifically on the role of governance and community granularity as moderating variables. An in-depth examination of the district's waste management structures has implications for sustainable urbanization more broadly and provides concrete recommendations for improving waste management in Kinondoni District and in other fast-growing metropolitan regions.

2.6 Waste Management in an Era of Urbanization

Urbanization is a trend of modern economic development that has drastically impacted waste disposal methods around the globe, especially in developing

countries. The accelerating growth of cities substantially enlarges both the amount and the complexity of the waste produced, posing tremendous problems for municipal organizations (United Nations, 2022). This is particularly evident in Kinondoni District, Dar es Salaam. The rapid urbanization induced by rural-to-urban migration and natural population growth has resulted in the emergence of informal settlements and growing obscurities in waste management (NBS, 2023). With urbanization, consumption patterns change, leading to an increase in heavy metals and non-biodegradable hazardous waste materials (United Nations, 2022). The study by Wilson *et al.* (2023), emphasizes that urbanites consume more packaged goods and imported materials that are not always as easy to process or recycle. In Kinondoni, plastics and electronic waste seem to be passing as the trends outpace the limited waste processing infrastructure in the district (NBS, 2023). The spatial outreach of urban centres is another significant dimension. Unplanned settlements, which arise due to urban sprawl, have complicated waste collection. Ahmed *et al.* (2023) point out that insufficient road networks and crowded settlements hinder accessibility for waste collection vehicles, resulting in waste build-up in public areas and waterways. In Kinondoni, which is one of the larger municipal councils in Tanzania, this situation has proved to be a bigger problem as informal settlements primarily lack proper waste disposal systems which contribute to environmental degradation (World Bank, 2023). Another aspect of urbanization's impact on waste management is health implications. Uncollected waste spreads diseases like cholera and dengue which are common in Dar es Salaam in the rainy season (WHO, 2022). Besides, ill-managed waste produces dangerous greenhouse gases like methane that are released from landfills and worsen the climate change consequences (IPCC, 2023). Additionally, the financial cost of handling waste rises with urbanization. Kinondoni Municipal Authorities are under increasing financial and technological pressure to improve their waste management infrastructure (World Bank, 2023). Public-private partnerships have been suggested, but the funds struggle to find a home due to regulatory obstacles and poor investor confidence in waste management (IPCC, 2023). As such, urbanization increased the amount, types, and difficulties of waste management in Kinondoni District. Solutions to these issues call for a multi-pronged effort that includes sustainable urban planning, public engagement, and technological innovation (UNEP, 2023).

2.7 Obstacles to the Implementation of Efficient Waste Management

In urban areas like Kinondoni District, ensuring that waste is managed appropriately comes with numerous challenges. These barriers include governance and infrastructure gaps, and behavioural and financial constraints. One of the major challenges to proper waste management is governance deficits. Due to weak institutional frameworks and fragmented responsibilities of municipal authorities, there are often inefficient activities (Wanga *et al.*, 2022). Kinondoni District, for example, has no comprehensive plan for streamlining its waste management streams so there is a lot of competition for resources (URT, 2018). Corruption adds to these governance problems (IPCC, 2023). Corruption and lack of accountability

erode public confidence and divert resources away from waste management programs (Transparency International, 2023). In addition, outdated policies that do not integrate modern waste management practices like recycling and composting further increase the inefficiencies (Ahmed *et al.*, 2023). The main barrier is the waste management infrastructure which is not enough. Kinondoni has limited collection vehicles, landfills that are of low quality, and no recycling facilities, which is typical of many urban areas in developing countries (Ofori *et al.*, 2023). A lack of basic civil infrastructure leads to a huge proportion of waste being uncollected and dumped into rivers, streets, and open spaces (Wanga *et al.*, 2022). Waste management is further complicated by informal settlements. Ahmed *et al.* (2023) note that poor road networks in such regions hinder collection vehicles from accessing residents, which makes them dispose of waste incorrectly. Also, most citizens do not practice the segregation of waste at their source, making recycling more difficult and further straining the disposal systems (URT, 2018). Most municipal budgets for waste management are stretched too thin to keep pace with growing urban populations. Sub-Saharan African cities are estimated by the World Bank (2023) to spend below 0.5% of their GDP on waste management, a far cry from enough to deliver adequate services. Kinondoni District is no exception, financial constraints have also hindered its capability to invest in new waste processing facilities or new technologies (Wanga *et al.*, 2022). Waste management as a revenue-generating technology is yet to be explored. Waste-to-energy projects, for instance, can offer a sustainable financing mechanism but encourage high upfront costs and regulatory uncertainties (UNEP, 2023). The Challenge of Public Awareness and Behaviour Public involvement is key to effective waste disposal, but Kinondoni and other urban areas are characterized by low public participation, Ahmed *et al.* (2023). Research by Nyambura *et al.* (2023) shows that littering and illegal dumping are caused by a lack of knowledge of proper waste disposal practices. Additionally, cultural mindsets that see waste management as strictly a job for the authorities inhibit local engagement (UNEP, 2023). Another barrier to progress is resistance to change. The introduction of waste segregation in Kinondoni has had limited success with people adopting waste segregation as a habit due to limited education and associated incentives (Wilson *et al.*, 2023). This violent urbanization has overrun Kinondoni's municipal planners. Many of these rural migrants would go on to settle in Dar es Salaam in search of economic opportunities, resulting in unregulated housing developments that put stress on already overextended waste management systems (NBS, 2023). Tackling these issues calls for holistic strategies that unite sound governance, sufficient funding, infrastructure improvements, and community involvement. Such barriers may also be overcome through collaboration and knowledge-sharing (UN-Habitat, 2023). This research hunts its primary subject to the social context from the article of Hybeer in Nepal, which is mainly related to the construction and interdisciplinary urbanization and waste management from the future challenges. This research also highlights several important variables, such as governance mechanisms and community participation that mediate the relationship between urbanization and waste management outcomes. The effect of urbanization on society's population

growth, economic activities, and spatial expansion are discussed under the umbrella of urbanization. These factors combined lead to waste generation, putting a strain on existing waste management systems. Urbanization in Kinondoni District reflects high-density settlement and changing consumption patterns requiring more responsive waste management approaches (NBS, 2023).

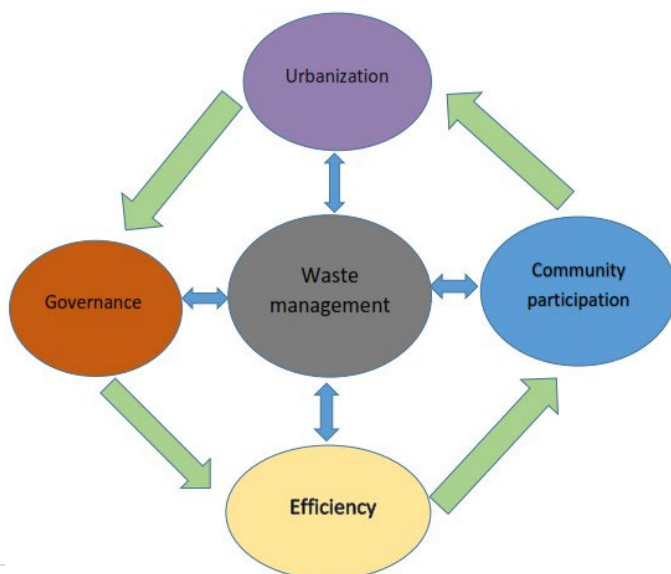
2.7.1 Dependent Variable: Waste Management Efficiency

Waste management efficiency is the ability of systems to effectively collect, process, and dispose of waste in an environmentally friendly manner. Key indicators include waste service coverage, recycling and reuse practices, and impact mitigation (UNEP, 2023).

2.7.2 Moderating Variables: Governance Mechanisms

Governance disrupting policy frameworks, institutional coordination, and resource allocation. Good governance prevents urbanization from swamping the waste management systems. Integrated waste management policies can promote a systematic, coherent, comprehensive, and efficient manner to reduce, recycle, or reuse waste (Wanga *et al.*, 2022). This includes areas like Community Participation where public involvement is key for sustainable waste management (UNEP, 2023). This encompasses activities such as sorting waste, recycling, and taking part in community clean-up programs. Strong community engagement results in better waste management outcomes (Nyambura *et al.*, 2023). It connects urbanization to waste by a conceptual framework and continues to be moderated by governance and community participation in waste disposal. Well, with good governance, we could counterbalance the negative effects of rapid urbanization, and with people involved, we could improve the waste collection and recycling process. This is according to the Theory of Urban Ecology, which emphasizes the relationship between urban growth and environmental systems (Wanga *et al.*, 2022). This viewpoint emphasizes the delivery of sustainable waste-management practices in urban settings that are adaptive and integrated (Marshall & Farahbakhsh, 2023).

2.8 CONCEPTUAL FRAMEWORK



This framework, applied to the context of Kinondoni District, offers a structured lens through which to examine and address the intricate interplay between urbanization and waste management in rapidly developing urban environments, paving the way for potential sustainable solutions.

2.9 Conclusion

The literature review reveals the considerable challenges of urbanization on waste management in developing cities and indicates that governance and community involvement are critical to overcoming those challenges. Urban ecology theory is a useful framework that helps us understand the designers, educators, and implementers of waste management systems within the context of urban growth and development. As useful as existing studies are, they do not answer questions relating to the specific dynamics of waste management challenges within districts like Kinondoni. This study set out to fill these gaps by providing an in-depth investigation into waste management in the Kinondoni District, an approach that will help develop evidence-based policies and practices to improve waste management efficiency.

CHARTER THREE: METHODOLOGY

Introduction

This chapter presents the methodology adopted for this study to obtain findings and conduct result analysis, as a case study in the Kinondoni District of Dar es Salaam, Tanzania, the study attempted to shed the effects of urbanization on waste management. Urbanization presents major difficulties for waste management systems, especially in rapidly developing contexts (World Bank, 2020). The research methodology was developed to capture the nuances of urbanization and its impact on waste management. A qualitative approach was adopted to investigate stakeholders' views, practices, and experiences in urban waste management and examine the impact of urbanization on waste management systems in Kinondoni District, Dar es Salaam. The qualitative design enables a comprehensive investigation of participant experiences, perceptions, and contextual factors that may be missed by quantitative methods (Mollel & Chaggu, 2021). The qualitative method was used to explore the lived experiences of district council staff, community leaders, and members of the public, using interviews and focus group discussions (FGDs). In the qualitative method, the study follows a case study design that has been well-documented for investigating complex social phenomena in a context (Yin, 2018). The study derived detailed & suitable data

focusing solely on Kinondoni District, examining the relationship between urbanization & waste management systems. This is consistent with the study's focus on governance, infrastructure, and community dimensions of solid waste management. The case study design was critical for connecting real-world practices with theoretical applications, such as the Theory of Urban Ecology which frames the understanding of the ecological impacts of urbanization (Kassenga *et al.*, 2020). The study population involved three key groups i.e., district council staff engaged in waste management governance and policy implementation, community leaders involved in the local waste management effort, and residents who experience urbanization and its related problems. Incorporating them into their analysis allowed them to better understand the issue from different lenses. I recruited subjects using a purposive sampling technique. As this is a qualitative study, where the objective is to explore the opinions or experiences of individuals about the research topic, this was a reasonable and suitable non-probability sampling method that permitted to identification of study participants who could be perceiving the phenomena being studied. The interviews covered 5 district council staff, including waste management officers, urban planners, and public health officials. Likewise, FGDs have been administered to two different groups of community leaders (approximately 8–10 participants). They were selected based on their work with community-led waste management programmes and their authority in their communities. Also, interviews with 40 households from different socio-economic backgrounds, including waste informal collectors have offered a glimpse into household waste management as well as the challenges being posed by urbanization.

3.1 Data Collection Methods

The main way of collecting data was through semi-structured interviews and FGDs. Semi-structured interviews provide an adaptable format wherein researchers can address predetermined thematic areas yet probe more deeply into novel topics as they arise (Palinkas *et al.*, 2015). This was done through interviews with members of the district council staff and selected residents to obtain in-depth information on governance structures and policy implementation experiences with waste management. This semi-structured format makes sure that the conversations remain on point while also allowing the participants to express their views in detail (Kvale & Brinkmann, 2015). The focus group discussions with community leaders have yielded collective perspectives on the waste management challenges and community engagement. FGDs are most effective for exploring group dynamics and uncovering shared experiences or differing opinions (*et al.*, 2004). The sessions ran for 90 minutes and each was moderated using a separate guide with open-ended questions covering topics such as the impact of urbanization on waste management, the role of communities, and potential solutions to the challenges identified. “To make people participate, we held discussions using the local language, Kiswahili, and then were later translated into English throughout the analysis.”

With participants' consent, all interviews and FGDs were audio-recorded, since this method ensures the accuracy of participant responses (Medina, M, 2010). Field notes were also used to record non-verbal expressions, contextual notes, and initial reflections about the data.

3.2 Data Analysis

The qualitative data collected via interviews and FGDs were thematically analyzed using NVivo software. Thematic analysis is a common approach to identifying, analyzing, and interpreting patterns within qualitative data (Braun & Clarke, 2006). Here are the six major steps involved in this process: familiarization by determining which elements of the audio recordings were more relevant and transcribing them as well as judiciously analyzing field notes to get an overall understanding of the data. Coding by approaching the data segment by segment gives codes that represent important ideas or themes like Van Kaam Analytical Procedure Searching for Relative Codes by discovering codes that form patterns throughout the data based on connections (Njeru, J. , 2006), and Research Reduction by reducing the content into relevant themes, and grouping codes (Scheinberg *et al.*, 2010), as well as Reports by generating an account of the themes which are related to each research question and Revision-themes by revising and refining themes while comparing them with the data to ensure their accuracy in representing the participants' narratives (Kaseva *et al.*, 2005). Besides, Identifying and Naming Themes by clearly defining each theme and how it relates to the research objectives (Edward, M., 2022). The process of Reporting consists of bringing together the findings into a holistic meaningful narrative that points out the main insights and their relevance to waste management systems in Kinondoni District.

3.3 Ethical Considerations

Main ethical issues were embedded in this study to guarantee participants' rights and personal safety. Ethical approval for the study was granted by the University of Central Lancashire, the school of Health, Social Work and Sport, and the Kinondoni Municipal Council; both of which ensured compliance with local and national guidelines. All volunteers were provided with an information sheet before participating in the study, which detailed the purpose, methodology, and potential risks associated with the study, enabling participants to provide informed consent. Written informed consent was obtained from all participants after making them aware of their right to withdraw at any time without penalty. This ensured that their involvement was entirely voluntary and was based on sufficient understanding. To protect privacy, confidentiality was ensured by anonymizing all identifying information and securely storing the gathered data. This was very carefully handled especially during Focus Group Discussions (FGDs) so that all the participants, including the marginalised, were free to express their views. Special efforts were made to facilitate open dialogue and to make sure that the voices of less dominant participants were elevated, and mitigate the risk of any group member feeling that

their voice was marginalized or silenced. Such ethical approaches were fundamentally designed to ensure trust and integrity during the study (Mmasi, *et al.*, 2021).

3.4 Limitations

Although this study seeks to develop a unified perspective on urbanization's influence on waste management systems, it does acknowledge some limitations. The use of self-reported data in interviews and FGDs has the potential to create bias such as social desirability bias (Kihila *et al.*, 2020). To mitigate this concern, as a researcher, I have assured participants that responses will remain anonymous and encouraged them to share candidly. Secondly, the intervention could have limited the sample size due to time constraints and resource limitations, which may hinder the generalizability of the findings. Despite this, the purposive sampling strategy ensured that the participants were well-suited to provide rich and relevant data. Lastly, the study was conducted in Kinondoni District and hence may not be transferrable to other urban situations in Tanzania or elsewhere.

3.5 Conclusion

This qualitative methodology is an effective framework for generating insights into the intricate relationship between urbanization and waste management in Kinondoni District. Using semi-structured interviews and FGDs, the study provides a well-rounded representation of the cultural frameworks and practices involved. Part of the thematic analysis addresses the richness of the findings, deeply rooted in the experiences of the participants themselves, thereby contributing to knowledge for policymakers, practitioners, and researchers in sustainable urban development.

CHAPTER FOUR: FINDINGS

Introduction

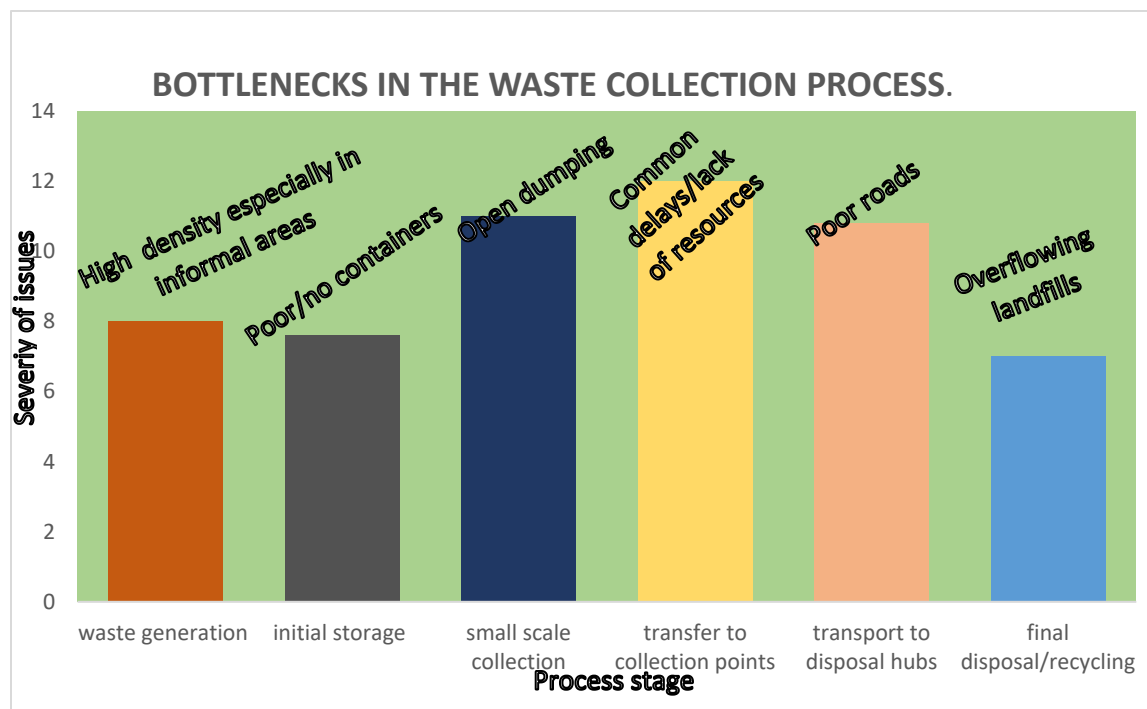
This chapter provides an account of the findings obtained from a qualitative study undertaken to investigate the impacts of urbanization on waste management systems within Kinondoni District, Dar es Salaam. As urbanization accelerates in sub-Saharan Africa, cities such as Dar es Salaam are confronted with persisting challenges in waste management, including rising waste generation, inadequate infrastructure, and weaknesses in governance (UN-Habitat, 2022). The data for this study was gathered through semi-structured interviews, focus group discussions, and non-intrusive observations to gain a wide range of views and obtain a full understanding. Key stakeholders included municipal officials, community leaders, and residents, with the intentional inclusion of traditionally

marginalized populations, including women, youth, and people with disabilities to provide an equity-based lens. The analysis presents findings across three themes: the linkage between urbanization and waste generation; the efficiency of current waste treatment facilities; governance and community involvement in waste disposal. Such macro themes highlight systemic inefficiencies, innovation opportunities, and prospects for inclusive stakeholder engagement to help solve urban waste challenges. Through unravelling these dynamics, this chapter contributes to how urbanization transforms waste management systems in fast-growing cities and sheds light on implications for policymakers, urban planners, and community stakeholders.

4.1 Findings

Different views on waste generation illustrated in this study are complemented by the significant urbanization evident within Kinondoni. Due to rapid urbanization, Kinondoni generates considerable waste; different views revealed herein enable a better understanding of that. Inadequate waste management services are worsened by high population growth rates in Kinondoni, especially in informal settlements (Wilson *et al.*, 2006). Maria Amani, a mother of four, and Juma Rashid, a retired teacher, residents in their early 50s, described how overcrowded neighbourhoods leave barrels of waste that cannot be picked up due to limited access to waste collection vehicles. According to community leaders, including Ibrahim Yusuf, chairperson of Mwenge Ward, informal settlement structures are not well planned, making it more challenging to collect waste. These findings correspond with those of Mollel and Chaggu (2021), who rather correlate urban sprawl with improper waste management. The district's lively economic activities have led to greater waste generation, from markets to shops and roadside vendors (Mugabi, *et al.*, 2020). For instance, Asha Mkubwa, a vendor at the market, reported that the tons of waste from the market are typically dominated by plastic packaging, and municipal officials like Leonard Mwakalebela at the Kinondoni Waste Management Office confirmed that waste that goes unmanaged comes mostly from commercial activities. From waste hotspots surrounding marketplaces and informal settlements, observational data highlighted priority intervention areas. These areas of high concentration are further highlighted on maps. Using observational data, we mapped hotspot waste generation areas around marketplaces and informal settlements, which indicated priority intervention areas. Maps are an even more striking way to express these concentrated waste zones (Nabegu,2010). The spending on disposable and non-recycled or reusable wearable items is also on the uptick with urbanization which is leading to knee-deep consumption, multi-use consumption evolved into single-use consumption (Ngoc & U. N. 2009). Bakari Juma, a university student, and members of my focus groups stressed the urgent need for public education around sustainable consumption. The research found multiple deficiencies in Kinondoni's waste-handling infrastructure, from collection efficiency to inadequate disposal infrastructure. Inconsistent garbage collection and a lack of resources have prevented effective waste disposal. Residents such

as Neema Njiro, a shop owner, complained about erratic services. Official statements by individuals like Stella Mwita of the Kinondoni Environmental Department, from the Kinondoni Municipal Council, also recognized how a lack of vehicles, personnel, and logistical planning were limitations. A bar chart below that categorizes waste by types, plastics, organic materials, and paper highlights the disproportionate share of plastics to the overall waste stream, suggesting that plastics need more targeted waste management policies.



Reference to field observations and interviews pointed to the shortcomings of existing landfill sites, which are unsensitised and inadequately regulated. Patrick Nyanda, a senior urban planner, pushed for investment in modern facilities, like recycling plants and composting units. These results are consistent with UN-Habitat (2020), which warns that overreliance on waste dumped in poorly managed landfills poses a significant environmental threat. Budget constraints proved to be especially challenging. Inadequate budgetary allocation for waste management, for instance, was identified as a challenge that compromises the integration of modern equipment or investments in innovative waste processing activities, officials like Stella Mwita noted. This is consistent with wider evidence from developing countries, where waste management is chronically underfunded (Oteng-Ababio, 2010). Aspects that were crucial to addressing the waste management challenges in Kinondoni, included governance and community participation. Weak governance structures are one of the key issues as pointed out by various stakeholders including Patrick Nyanda and there remains a gap in policy implementation, which is a serious barrier for good management. Although there are national policies, such as the National Environmental Management Act (2004), to provide a framework, enforcement is often lacking as coordinating surrounding agencies prove territorial (Nabegu, 2010). Wilson *et al.* (2012) also emphasize

governance as a key pillar of effective waste management systems. The community members were interviewed and observed to reflect little public participation in waste management. Youth representatives like Hawa Juma mentioned the lack of educational campaigns on waste segregation and recycling. Discussions during the focus groups indicated a general lack of awareness, suggesting that outreach strategies will need to be inclusive of the community in general. The focus groups revealed low engagement of households in waste segregation, highlighting this issue. Meanwhile, community-based programs have shown promise despite systemic barriers. Small-scale waste segregation and recycling projects have also been spearheaded by NGOs to involve residents in sustainable practices. But people like Ibrahim Yusuf still have leaders saying these programmes are difficult to sustain, as funding is quite limited. The focus group with community leaders revealed that people are not training for waste segregation at the grassroots level.

4.1.2 Implications of Findings

These findings provide important insights into the challenges posed by unmanaged waste in Kinondoni and underline the need for integrated and collaborative approaches to address these challenges effectively for environmental sustainability, public health, and economic development in the region. Indisposed waste has caused serious soil and water pollution, exacerbating the health risk of the Kinondoni population (Zurbrügg *et al.*, 2012). Frequent disease outbreaks, like malaria and cholera, were reported by community members and leaders to be directly related to stagnant waste. This is an indication of health risks that require immediate intervention through the establishment of an integrated waste management system that ensures environmental protection and health promotion. These systems would help lower pollution, reduce the disease burden, and enhance the quality of life for residents. In addition to reducing risks, waste management can be an untapped economic opportunity (Njeru, J. 2006). Recycling industries and waste-processing ventures can boost employment and spur local economies (Mugabi *et al.*, 2020). Residents such as Maria Amani and Juma Rashid have pointed to the business potential waste management could create. But local official Leonard Mwakalebela warned that such efforts depend on large financial investments and supportive policy frameworks. Making these opportunities happen requires putting economics first when considering private-sector participation and developing public-private partnerships. The results highlight the importance of a holistic approach that unites governance and private sector actors, as well as communities. Nairobi's waste management reform lessons highlight the benefits of integrative approaches including recent collaborative composition establishment, infrastructural development, and awareness or informational campaigns (Kabera *et al.*, 2021). A similar model could suit the Kinondoni context, focusing on synergetic waste solutions. A conceptual framework that integrates these elements facilitates the design and implementation of reforms that are aligned with environmental, economic, and health goals. Lastly, the results offer useful recommendations for

sustainable development in Kinondoni, which demands an urgent and collaborative approach to waste management.

4.1.3 Conclusion

The challenge of managing waste in Kinondoni District has so far been worsened by urbanization, evidenced by increased waste generation, poor infrastructure, and poor governance. However, these challenges threaten not only the environment but also the quality of life for residents, highlighting a pressing need for effective interventions. These issues, among others, underscore a plethora of opportunities to strengthen waste management systems through improved community engagement, governance, and practices. Identifying avenues of potential synergy, including the use of technology, public-private partnerships, and citizens lead to waste reduction and recycling initiatives. This two-sided view of struggles and chances highlights the complexity and dualism of urban management in a fast-paced developing district like Kinondoni. This approach highlights an opportunity to convert waste management to a system that is sustainable and resilient through exploiting social and technological innovations whilst addressing systemic weaknesses. This expertise is a vital starting point for the recommendations made in the next chapter, designed to aid stakeholders in promoting sustainable urban development. The strategies proposed in this study not only help to solve the immediate needs of Kinondoni District in terms of waste management but also support Kinondoni District in pursuing broader environmental protection, social well-being, and economic growth while informing future studies and policymakers for a broad impact.

4.2 Discussion

4.2.1 Introduction

The influence of urbanization has brought major transformations in Kinondoni District, Dar es Salaam, significantly reshaping its social, economic, and physical landscape, Edward, M. (2022). Kinondoni, as one of the fastest-growing districts of Tanzania's largest city, is representative of more global trends of rapid urban expansion across Sub-Saharan Africa, Mbuligwe *et al.*, (2004). Urbanization can provide opportunities for economic development, better infrastructure, and greater social mobility, but it also poses complex problems (Zurbrügg *et al.*, 2012). Waste management, in particular, has emerged as one of the major concerns. Sprawling piles of trash on roadways and streets, according to the district's environmental official like Aisha Jumwa on waste management, point to deep systemic flaws in urban planning, sanitation governance, and public service delivery. The results from this study uncovered a complex and layered representation of needs and opportunities in Kinondoni's waste management systems. Waste collection, transport and disposal are highly inefficient in many cases, and the situation is worsened by poor infrastructure, lack of finance and weak inter-institutional coordination on the other hand. Conversely, such dilemmas also lead to

opportunities for innovation, stakeholder engagement, and policy reform so as to successfully develop sustainably cities (Oteng-Ababio, 2010). Therefore, waste management is a microcosm of the wider systematic failures and opportunities of urban governance in Kinondoni District. Urban growth in Kinondoni is a glimpse into a demographic transition with promise, but also peril. Over the last two decades, rural-to-urban migration and natural population growth have fueled a dramatic increase in the population of the district, (Wilson *et al.*, 2006). This population surge has driven economic dynamism and infrastructure growth but has also resulted in heavy strain on local governments to deliver basic public goods (Mmasi *et al.*, 2021). Waste management, especially, has borne the brunt of this crisis, with existing systems unable to handle the increase in waste generation. This chapter aims to locate the findings of the study within broader theoretical and empirical frames of analysis related to urbanization, governance, and sustainable development. By examining the challenges and opportunities highlighted in Kinondoni's waste streams' systems, the discussion seeks to shed light on the interconnection of urbanisation, governance, and sustainability. It thus takes an interdisciplinary perspective of the waste management crisis and its implications for urban governance. It also provides a wider context for these findings and is placed within the United Nations Sustainable Development Goals (SDGs), particularly Goal 11, which aims to make cities inclusive, safe, resilient, and sustainable. Urbanisation is one of the most evident links to service delivery in both cities and rural areas (Kaseva *et al.*, 2005). This rapid growth has overwhelmed municipal authorities in Kinondoni concerning the provision of basic services, such as waste disposal. This gap between population growth and service provision capacity is a defining feature of rapidly urbanizing regions of the Global South (Kihila *et al.*, 2020). Kinondoni's experience, however, is distinct in that its unique governance and infrastructural problems require concerted interventions and localized solutions. This chapter frames these challenges under the broader themes of governance and sustainable development and contributes to the discussion of urban resilience. It is through waste management in Kinondoni that wider issues of urban governance can be seen. These problems in waste collection transportation and treatment are illustrative of wider institutional failures and weaknesses. In debris, the billions of Tanzanian shillings with the coordination of municipal departments and lack of clear mechanisms of accountability have positioned troubling management of waste (Mugabi, *et al.*, 2020). These results highlight the need for integrated governance frameworks that encourage interdepartmental collaboration, stakeholder involvement, and accountability. In addition, according to the study, financial constraints affect the effectiveness of waste management systems (Kihila *et al.*, 2020). Insufficient financing for waste management services is a major obstacle to sustainability and requires creative solutions for mobilizing resources (Kassenga, *et al.*, 2020). The results also highlight the impact of waste management challenges disproportionately burdening vulnerable communities. Inadequate waste collection services affect informal settlements, which constitute a large proportion of Kinondoni's residents. Waste collectors working outside of the formal governance framework are often seen as

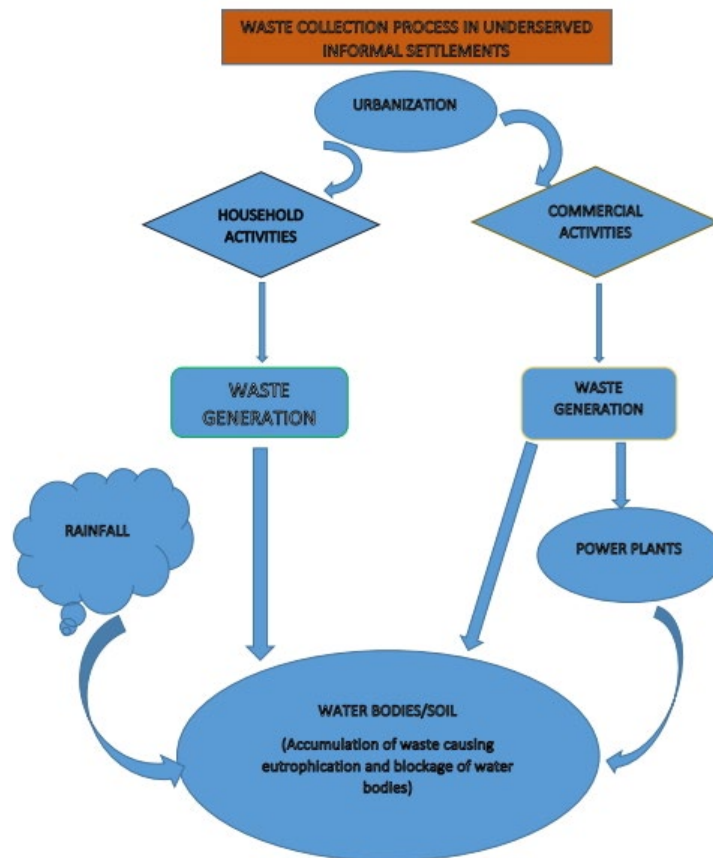
the only source of recycling and diversion in low-income communities, but they lack access to resources and legal status, which can make all the difference. It underscores the importance of inclusive governance frameworks that allow for the participation of disenfranchised groups and acknowledge the roles of unregistered players in the disposal process. The results of the study resonate with the theoretical thinking of urbanization, characterized as an opportunity as well as a threat to social, economic, and spatial development (Nabegu, 2010). Urbanization, therefore, is a manifestation of economic development and social change but it also brings vulnerabilities that need to be addressed through governance and planning (Njeru, 2006). This is where the dual trends are evident, such as with the waste management crises in Kinondoni. It exposes the flaws in current governance systems, but also reveals opportunities for innovation and reform. Kinondoni needs to take a creative approach to urban governance to harness urbanization prospects as drivers for sustainable development. Two other significant themes emerging are the importance of community engagement in tackling waste management issues. Furthermore, involving communities in the waste management process can improve service delivery, accelerate behavioural change, and strengthen social cohesion. Yet, the research exposes, no such effective engagement mechanisms can be found in Kinondoni. This emphasizes the importance of participatory governance models that engage citizens in decision-making processes. Participatory governance literature indicates that much attention to empowerment through training, and skills development funding can enhance municipal solid waste management performance at all levels (Zhao *et al.*, 2020). This chapter additionally contextualizes the findings of the study concerning other SDGs, with special reference to Goal 3 (good health and well-being), Goal 6 (clean water and sanitation), Goal 11 (sustainable cities and communities), Goal 12 (responsible consumption and production) and Goal 13 (climate action). To reach these targets, a paradigm shift in waste management practices is essential, shifting from a linear 'take-make-dispose' model toward a circular economy (Edward, 2022). The framework of circular economy with emphasis on effective use of resources, minimization of waste generation, and recycling loops can be a good start to address the Kinondoni waste management problem. The district can address this by implementing circular economy practices that minimize negative impacts on the environment while generating employment prospects and enhancing community health.

4.2.2 Urbanization & Generation of waste

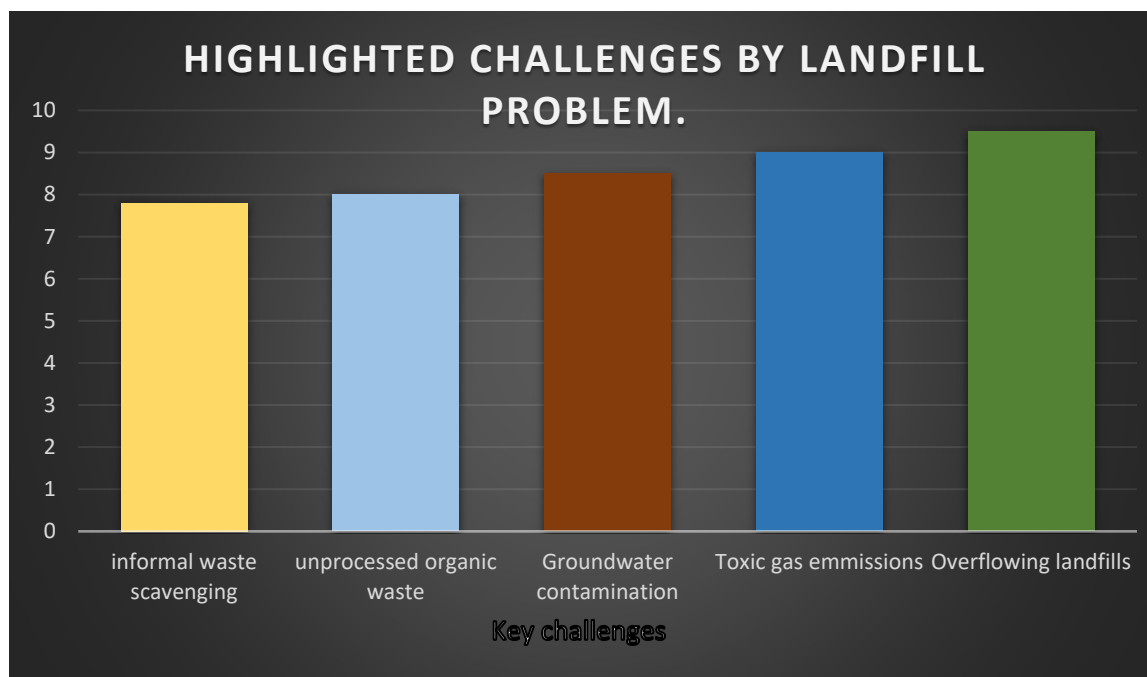
The Kinondoni District has been urbanizing very rapidly with a lot of waste produced which poses great challenges to waste management systems. This portion delves deep into the interrelationship between population surge, economic endeavors, and the transformation of consumption habits that exacerbate these issues. Asha Bunda, a Kinondoni resident pointed out that the population explosion, particularly in the country's informal settlements, has resulted in an excessive demand for waste management services. Such challenges are further

compounded by overcrowding, poor urban planning, and the unplanned nature of settlements. Residents such as Maria Amani and Juma Rashid, noted that the limited number of waste collection vehicles has led to uncollected waste overflowing in their neighbourhoods. This is due to theories surrounding urban sprawl, which suggest that when cities grow rapidly and without regulation, cities can develop faster than the infrastructure necessary to serve individuals (Satterthwaite, 2020). In addition, Kinondoni has one of the fastest urbanization rates in Tanzania, the National Bureau of Statistics, and municipal planning has not kept pace (NBS, 2022). Continuing urban sprawl, without appropriate investments in waste management infrastructure, exposes the most vulnerable populations to environmental and health hazards (Mugabi *et al.*, 2020). Uncollected waste encourages the proliferation of disease vectors such as mosquitoes and rodents which can trigger outbreaks of malaria and cholera (WHO, 2019). Systemic solutions are required by integrated urban planning incorporating strong waste management measures. Population growth also generates larger volumes of domestic waste, putting additional pressure on existing systems. Urban areas (especially informal settlements), can generate as much as 60% more waste per capita than their rural counterparts (Wilson *et al.*, 2012). Without containers or spots for dumping waste, residents have no option but to open dump or burn their waste, leading to air and soil pollution. These strategies must also include informal settlements in waste management plans and investments in sustainable waste disposal infrastructure. In Kinondoni, waste generation is mainly from economic activities, including SMEs, markets, and informal places of business. Commercial areas have high levels of non-biodegradable waste, predominantly plastics, as illustrated in interviews with stakeholders including Asha Mkubwa and Leonard Mwakalebela. These findings are consistent with research by Wilson *et al.* (2012), shedding light on the relationship between economic growth in urban zones and plastic waste accumulation. The socioeconomic vibrancy of Kinondoni, advantageous as it was, is also paradoxical. On one hand, it creates jobs and increases local incomes; on the other hand, it strains the environment. Plastic waste makes up a huge part of the waste in any market and small and medium-scale enterprises (SMEs), which can be addressed by limiting its production and disposal (UNEP, 2023). Public-private partnerships can also be crucial in establishing recycling plants to properly manage non-biodegradable waste (UNEP, 2019). Research by Jambeck *et al.* (2015) suggests that urban areas with high levels of economic activities are often biofilters for plastic waste leakage into the environment. In Kinondoni's commercial zones, similar disparities abound, as poor waste sorting makes it hard to recycle. The efficiency of recycling systems can be greatly improved through the implementation of source-separation policies and awareness campaigns. Urbanization has driven consumers toward disposable rather than durable goods, complicating waste streams even further. The outsized role of plastics in waste mirrors broader global trends. Research by Jambeck *et al.* (2015) on the leakage of plastic waste into oceans reinforces these findings, suggesting that long-term environmental consequences of insufficient waste disposal have become apparent. The shift towards a consumer culture centered on

convenience goods has contributed to the difficulties of waste management. According to Said Bakari, a student at Ardhi University (ARU) and participants in focus groups (FG), single use plastics are an important part of the waste stream in Kinondoni. This is consistent with a World Bank report (2020) which notes that disposable plastics are among the top drivers of urban waste in developing countries. To combat this trend, there needs to be an increase in campaigns promoting “the 3Rs”- reduce, reuse, recycle. In the absence of culturally tailored interventions, behavioural change will continue to remain a challenge. For example, community-focused programmes utilising traditional narratives and practices can effectively encourage sustainable consumption and practices. Policy measures, including bans on single-use plastics and producer responsibility laws for waste, are also necessary for limiting the environmental impact of shifting consumption patterns (Mmasi *et al.*, 2021). The limited capacity of Kinondoni’s waste management systems is a major obstacle to sustainable waste disposal. The following section also assesses some of the systemic shortcomings noted in the areas of waste collection, infrastructure, and financing. Cetera waste collection systems are ineffective in Kinondoni. Irregular schedules for collection, a lack of vehicles, and poor logistical planning have resulted in significant percentages of waste being unmanaged. The frustration voiced by residents such as Neema Njiro highlights the real-world effects of such inefficiencies.



Inefficiencies address underlying structural problems, such as resources not being enough but mismanaged, a lack of accountability, and so on. UN-Habitat (2020) outlines a few possibilities in this area, including the adoption of digital technologies (like GPS tracking for collection vehicles) to help optimize route planning and increase service reliability. Additionally, integrating informal waste pickers into formal waste management systems can improve collection rates. Such models have been successful in countries such as India and Brazil where informal workers play a crucial role in recycling (Medina, 2010). Kinondoni could emulate these models by offering training, equipment, and incentives to informal waste collectors. Kinondoni’s dependence on barely managed landfill sites is a major weakness. This leads to a continuation of actions that pollute the environment and endanger health due to a lack of modern facilities from recycling plants to composting units. Patrick Nyanda's pitch for investment in modern waste processing infrastructure is backed by global best practices. For instance, the South Brazilian city of Curitiba has successfully integrated such waste disposal services into its waste management system, thus ensuring less reliance on landfills (UNEP, 2019).



Modernization of waste infrastructure is capital-intensive and may be effective if deployed through public-private partnerships (PPPs). Kigali and Singapore have implemented PPPs successfully to fund state-of-the-art processing facilities, achieving a balance between financial sustainability and environmental outcomes (Wilson *et al.*, 2012). Financial constraints proved to be major hindrance to effective waste management. Municipal officials such as Stella Mwita pointed to the small budget dedicated to waste management, limits innovation and modernization. A study conducted for developing countries found that waste management accounts for less than 0.5% of GDP (World Bank, 2020), which is in line with this finding. Innovative financing mechanisms like “polluter pays” schemes and waste-to-energy ventures provide potential solutions. These methods have the potential to create streams of revenue while supporting sustainability. Waste-to-energy plants in Stockholm, for instance, successfully turned municipal waste into

electricity and heating, proving that such attempts make economic sense. (European Environment Agency EEA, 2018). The major question to Kinondoni District Officials on waste management systems was how best governance works with community participation to address waste challenges in Kinondoni. This section assesses governance gaps, and opportunities for improving community involvement as it reveals a serious policy implementation gap and a tendency to pay lip service to an NEMA, 2004 type of robust framework. Municipal officials like Patrick Nyanda explained these gaps as resulting from weak enforcement mechanisms and lack of stakeholder coordination. Research by Kabera *et al.* (2021) highlights that governance is the linchpin of successful management. Through these comparative examples as rooted within Brazil and Rwanda, it can be seen how transformative impact occurs by decentralization of governance structures that empower local authorities and communities. It is an approach Kinondoni should adopt, one dedicated to transparent, accountable governance. Then, municipals would create their validators within this decentralized network, which is a decentralized governance structure that would enable them to customize waste management for their community. Moreover, the establishment of collaboration among government bodies, NGOs, and also private actors can improve the entire waste management system. The systemic inefficiencies in waste management are equally cause and an effect of low levels of community participation in waste disposal. Interviews with representatives of youth organizations like Hawa Juma also showed there are no educational campaigns to promote segregation and recycling. The little involvement of households in the segregation of waste shows a wider social indifference towards waste segregation. But community-based programmes have proven to be effective. Programmes of Kinondoni waste segregation workshops for community leaders show the positive impact of local-based behaviour change actions. Scaling these efforts requires continued funding and collaboration with other NGOs, as well as more formal integration into municipal waste management systems. Yet these challenges are systemic and initiatives with NGOs and community groups provide us with useful lessons. For instance, projects that focus on community-level composting have demonstrated success in both source-reduction of organic waste and the cultivation of local ownership. These initiatives adhere to Elkington's (1997) triple bottom line that balances environmental, social and financial benefits. Kinondoni can scale these successes by adopting a multi-stakeholder approach, working with municipal authorities, NGOs, and private sector actors. Integrated waste management models convey sustainable outcomes through collaborative frameworks demonstrated in conceptual diagrams. The implications of these findings and the critiques offered here are significant, particularly in the areas of environmental sustainability, public health, and economic development in Kinondoni. This section combines these insights into actionable policy recommendations for policymakers, practitioners, and stakeholders. Kinondoni experiences a huge amount of unmanaged waste that is creating a lot of environmental degradation and also a public health hazard. The pollution of water and soil, along with an increase in disease vectors, highlights the need to

implement integrated waste management strategies. For instance, recent comparative studies, such as those shown in cities like Kigali, illustrate how stringent regulations, coupled with community participation, result in successful achievement of zero waste goals (Wilson *et al.*, 2012). No one can deny that proper waste management systems have economic potential. Industries such as recycling, for instance, are capable of job creation while doing less environmental damage. Locals such as Maria Amani and Juma Rashid explained how waste processing could provide a basis for entrepreneurship. Policy initiatives at the municipal level should thus be focused on creating enabling environments for such ventures, including tax breaks and capacity building programmes. In this regard, the waste management problems in Kinondoni require integrated approaches involving all stakeholders. The findings include progressive conceptual diagrams that show the potential of such models, combining governance reforms, infrastructure investments, and community participation. Guided by best practices from around the world, Kinondoni can forge a new trail towards sustainable urban development which prioritizes environmental stewardship alongside economic growth.

4.2.3 Conclusion

The results obtained from exploring urbanization in Kinondoni District and waste management indicate a critical problem that can be reinstated. Grounded in both theory and evidence, this analysis has critically considered the interstices of rapid population growth, expanding economic activities, and systemic governance deficits. The challenges are substantial, but they are surmountable. Kinondoni can use its waste management as a trailblazer of sustainability, when, and if, direct, concerted action is taken. Innovative solutions including the utilization of technology to improve the effectiveness of waste collection and treatment methods must be focused on. Just as crucial is the promotion of civic engagement. These solutions must be contextually relevant and widely accepted; to achieve this, education and participatory decision-making processes empower residents and build ownership in these solutions. Additionally, integrated approaches that link waste management with urban planning, economic development, and environmental protection will help strengthen resilience. Whitaker said the analysis would benefit regions similar to Kinondoni that are also growing rapidly and journeying towards similar challenges (Edward, 2022). Through collaborative governance, strategic resource allocation, and robust monitoring systems, the district can address such issues, ensuring sustainable urban development that could serve as a model for other regions. Lessons learned here build a strong foundation for the more global recommendations found in the chapter that follows. With these recommendations, the objective is to translate the gaps identified through the research into actionable insights that direct Kinondoni towards a vision in which it is the leading authority on the advancement of innovative waste management strategies in Tanzania and potentially across the globe. Transforming is not just possible, but necessary for the sake of its residents and the environment.

Introduction

This chapter serves as the final analysis chapter of this study, summarising the findings' broader implications and actionable recommendations. This aspect of waste management challenges in Kinondoni District is discussed again as the zoning and urbanization continue, and it serves as a unifying summary of the main findings of the respective research. As such, this chapter concludes with key implications for research and strategic methodologies to address the district's highlighted challenges for sustainable waste management.

5.1 Implications of the Study

The study highlights key challenges facing waste management systems in rapidly urbanizing regions such as Kinondoni. First, it underscores the urgency of finding solutions to a widening gap between the amount of waste generated and the district's ability to dispose of it responsibly. Until this is done, these issues will only get more severe, with dire environmental and public health consequences. In addition, the results highlight the need for governance in waste management. Furthermore, findings stress the need for governance in waste management. Pouring more money into the institutional structure, the systems, and the policies can be quite nebulous, but the proper institutional framework and inter-agency coordination can help execute and enforce the policies. Moreover, the findings indicate that community engagement is an essential factor in good waste management practice. The climate challenges associated with waste management are evident but also highlight the economic dimension of this challenge, as there are opportunities to reuse waste through waste-to-energy technologies, and as a result, they can be redesigned as part of the circular economy in greening the economy.

5.2 Limitations and Recommendations

Although the study offers a thorough analysis, some limitations need to be noted. The first limitation was that data collection was restricted to Kinondoni District, thus limiting the generalisability of the findings to other urban areas across different socio-economic and environmental contexts. Moreover, the study was mostly limited to municipal solid waste, and given that it may neglected the problem related to industrial and hazardous waste management. Identifying and addressing these gaps in future studies will aid in building a more holistic perspective of urban waste management. A more holistic view of urban waste management may be achieved by closing these gaps in future research. Based on the findings from the study, several strategies have been proposed to address these challenges. In addition to strengthening enforcement mechanisms of current waste management policies to enforce compliance, improved inter-agency coordination and communication to streamline policy implementation and accountability is also pertinent. Waste management can be improved by giving frequent training and capacity-building programmes to municipal authorities. Another significant domain is infrastructure development where we need to focus on allocating funds for building up modern waste processing infrastructure, such as recycling units, composting bases. Similar

efforts can be recorded for local government waste management, upgrading and managing landfill sites to reduce environmental risks or improve health and safety standards, and implementing a GPS-based route optimization system to help improve the efficiency of waste collection. This is where community engagement comes into play because it is crucial for sustainable waste management. There should also be large-scale public awareness campaigns on waste segregation, recycling, and sustainable consumption practices. Efforts to integrate community-based waste management solutions into municipal plans with sufficient funds and resources will maximize their impact. It's also important to encourage participatory planning processes that truly engage residents in decision-making on matters of waste management. This is where the role of economic incentives comes into play. It is also recommended to provide subsidies or tax rebates for businesses and individuals who make efforts to practice sustainable waste management, for example, in recycling and biodegradable packaging. Additionally, by supporting waste-to-energy projects, as well as promoting investments in circular economy models, innovation and sustainability will continue to grow. If governments fail to deliver, we can and must harness public-private partnerships (PPPs) to expand investment and innovation in waste management systems (Edward, 2022). Waste management projects with large scale need innovative financing mechanisms (Kassenga *et al.*, 2020). Issuing municipal bonds or other financial instruments can raise the funds needed, as well as accessing carbon credit markets to finance sustainable waste programmes and reduce greenhouse gas emissions (Mmasi *et al.*, 2021). Strengthening institutional mechanisms and inter-agency coordination can greatly enhance the implementation and enforcement of policies. Working with international organisations, funds, and development agencies can also attract additional funding and technical expertise in support of waste management reforms. The implementation of these recommended solutions will be critical to ensure that Kinondoni's waste management system is transformed. With collaborative action from policymakers, community stakeholders, and private-sector actors, Kinondoni can represent an exemplary initiative in sustainable urban waste management that leads to enhanced environmental quality, generates economic opportunities, and improves the quality of life for residents.

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APPENDIX 1 CONSENT FORM FOR PARTICIPANTS

Title of project: Evaluating the Impact of Urbanization on Waste Management Systems: A Case Study of Kinondoni District, Dar es Salaam, Tanzania

Please tick initial boxes

1. I have read about this project (or I had information about this project read and explained to me) and I understand what this project is about. I have asked all the questions I wanted and had my questions answered in a way I understand.

2. I understand that I do not have to take part in this project and that it is OK to stop taking part at any point up until the end of the questionnaire/group discussion, without having to give a reason. If I choose to do so the data from my interview will not be used and this will not affect my residence and civil/human rights in any way.

3. I give permission for the researcher to take me through the questionnaire, have discussion with me and to record this using a Dictaphone.

4. I understand that quotations from my discussion may be used but that my name will not be used in any of the publications and reports or presentations given by the researcher. I understand that my name will be kept in a locked facility in the University of Central Lancashire in accordance with the data protection act and only the researchers will have access to this information.

5. I agree to take part in this project.

Name of participant

Date

Signature

Name of person taking consent

Date

Signature

Appendix 1

Section 1: Community Participation in Waste Management

Community Individual Participant Questionnaire

1. How effective are community forums in addressing waste management issues?

2. Have you participated in any surveys related to waste management?

- A. Yes []

- B. No []

3. How can local businesses assist in improving waste management efforts in your community?

4. Have you collaborated with local NGOs on waste management issues?

- A. Yes []

- B. No []

5. How essential is it to educate children about waste management?

6. Have you taken part in any community recycling initiatives?

- A. Yes []

- B. No []

7. Do you think urbanization has negatively impacted waste management in your area?

- A. Yes []

- B. No []

8. Have you received any information on how to reduce waste in your household?

- A. Yes []

- B. No []

9. In what ways could partnerships between the public and private sectors enhance waste management in your community?

10. Please describe and explain your experience with waste collection scheduling in your area.

Here's the section with a different heading for the waste management survey:

-Section 4: Assessment of Waste Management Awareness and Practices

1. What advantages do you associate with effective waste management? (Select all that apply)

A. Improved public health []

B. Enhanced environmental quality []

C. Increased community pride []

D. Economic benefits through recycling []

E. Other: _____

2. How often do you utilize local waste management services?

A. Weekly []

B. Monthly []

C. Occasionally []

D. Rarely []

E. Never []

3. What do you believe are the obstacles to effective waste management? (Select all that apply)

A. Lack of public awareness []

- B. Insufficient funding []
- C. Inadequate infrastructure []
- D. Poor community involvement []
- E. Other: _____

4. What type of waste do you produce most frequently?

- A. Organic waste []
- B. Plastic waste []
- C. Electronic waste []
- D. Paper waste []
- E. Other: _____

5. How do you prefer to receive information regarding waste management?

- A. Community newsletters []
- B. Social media platforms []
- C. Local news outlets []
- D. Community meetings []
- E. Other: _____

6. Which form of community engagement do you believe is most effective for enhancing waste management?

- A. Educational programs []
- B. Clean-up campaigns []
- C. Workshops and training []
- D. Community forums []
- E. Other: _____

7. How satisfied are you with the waste management services provided in your locality?

- A. Very satisfied []
- B. Satisfied []
- C. Neutral []
- D. Dissatisfied []

E. Very dissatisfied []

8. What is the primary challenge you encounter concerning waste disposal?

A. Access to services []

B. Knowledge of proper practices []

C. Cost of services []

D. Availability of recycling options []

E. Other: _____

9. In your view, what improvements could be made to waste management services?

A. More frequent collection []

B. Enhanced public education []

C. Increased funding []

D. Better recycling programs []

E. Other: _____

10. How do you assess the effectiveness of current waste management policies in your area?

A. Very effective []

B. Effective []

C. Neutral []

D. Ineffective []

E. Very ineffective []

APPENDIX 2: QUESTIONNAIRE FOR STAFF PARTICIPANTS (ENGLISH VERSION)

This questionnaire is intended to gather insights regarding the waste management systems in Kinondoni District, Dar es Salaam. Your feedback will be instrumental in assessing the current status of waste management and identifying areas that may need improvement. Please provide your responses as thoroughly as possible.

Section 1: Respondent Information

1. Gender: _____

- A. Male []
- B. Female []
- C. Other []

2. Age: _____

4. Occupation: _____

5. Education Level:

- A. Primary []
- B. Secondary []
- C. University []
- D. Other: _____

Section 2: Awareness of Waste Management Services

1. Are you aware of waste management services provided by the local government?

- A. Yes []

- B. No []

2. Have you been involved in any awareness campaigns about waste management?

- A. Yes []

- B. No []

3. How does effective waste management contribute to better public health?

4. What types of waste are generated in your household?

5. Have you attended any workshops or training sessions on waste management? If yes, please provide details. Yes [] No []

6. What methods do you know for safely disposing of hazardous waste?

7. Can you identify any recycling programs in your area?

8. Have you encountered public service announcements related to waste management? If yes, please describe.

9. Why is community participation vital for effective waste management?

10. What discussions have you had with your neighbours regarding waste management issues?

Section 3: Views on Waste Management Issues

1. Do you consider waste management to be a significant issue in Kinondoni District?

- A. Yes []

- B. No []

2. Have you ever utilized a SACCO (Savings and Credit Cooperative) to support waste management initiatives?

- A. Yes []

- B. No []

3. Do you believe local government policies regarding waste management are communicated effectively to the public?

- A. Yes []

- B. No []

4. Have you experienced health issues in your community that you attribute to waste management practices?

- A. Yes []

- B. No []

5. Do you know the budget allocated for waste management in your department?

Yes []

No []

6. What are your thoughts on the funding allocated for waste management in your department?

7. Please describe any challenges you have faced accessing waste disposal services.

7. In your opinion, do cultural beliefs affect waste management practices in the community? If so, how?

8. Are you aware of recent government initiatives to enhance waste management?

- A. Yes []

- B. No []

9. How do individual actions influence the success of waste management efforts?

10. Have you ever felt unsafe in your neighbourhood due to waste accumulation?

APPENDIX 3: QUESTIONNAIRE FOR FGD (ENGLISH VERSION)

This questionnaire is intended to gather insights regarding the waste management systems in Kinondoni District, Dar es Salaam. Your feedback will be instrumental in assessing the current status of waste management and identifying areas that may need improvement. Please provide your responses as thoroughly as possible.

Section 1: Respondent Information

1. Gender: _____

- A. Male []
- B. Female []
- C. Other []

2. Age: _____

4. Occupation: _____

5. Education Level:

- A. Primary []
- B. Secondary []
- C. University []

Section 2: Focus Group Discussion

Assessment of Waste Management Awareness and Practices by Community Leaders

Kinondoni District Focus Group Questions (Community Leaders): Respond to the following 10 questions regarding waste management and practices in Kinondoni District.

Mindset: Someone who is environmentally aware, thinks before generating waste.

1. What are the common types of waste that arise in your locality, and how well do the members of your community know about managing these?

Existing methods of disposal of waste

2. How are residents and businesses in your area disposing of their waste today? Do these techniques work, or are they just backfiring? Waste Management

Community Challenges

3. What waste collection, transportation, and disposal problems does your community experience?

The Local Government and Institutions

4. What is the involvement of local government or other institutions in waste management and how successful have their interventions been?

Informal Waste Practices

5. Is there any informal waste disposal practice like open dumping or burning and its effects on health and the environment?

Recycling and Reuse Question

6. Is there some kind of recycling or reuse of waste in your community? If there is, how would they scale or improve?

Involvement and Ownership of the Community

7. How engaged or involved are the members of the community in waste management programs or initiatives? What drives or prevents them from engaging?

Environmental and Health Issues

8. What environmental/health issues has the district been facing because of such imprudent waste disposal?

Awareness of Policy and Regulation

9. Do community members know about viable waste management policies and regulations? So, how are these being enforced on the ground?

Suggestions for enhancement

10. What changes would you suggest to improve trash disposal in your community, and what do you think the responsibility of a community leader on that matter should be?