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TITLE

WASTE MANAGEMENT CRISIS IN ZIMBABWE: EVIDENCE FROM WATERFALLS LOW-DENSITY SUBURB, HARARE

By

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SUPERVISOR: DR MUKWENYI

2026

DECLARATION

I, Lynne Rocky, hereby declare that this dissertation titled "Waste Management Crisis in Zimbabwe: Evidence from Waterfalls Low-Density Suburb, Harare" is my own original work. All sources of information used in this study have been duly acknowledged through appropriate citations and references. This work has not been previously submitted for any degree or examination at any other university or institution.

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APPROVAL FORM

This dissertation, titled "Waste Management Crisis in Zimbabwe: Evidence from Waterfalls Low-Density Suburb, Harare," written by Lynne Rocky (Reg Number: B221895B), has been approved as meeting the standards for partial fulfilment of the requirements for the degree of Bachelor of Science in Sustainable Development.

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DEDICATION

To my family, whose unwavering support and encouragement has sustained me throughout this academic journey. To the residents of Waterfalls Suburb also, whose patience and cooperation made this research possible and to all those working tirelessly to improve urban environmental management in Zimbabwe.

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ABSTRACT

This study investigates the waste management crisis in Waterfalls Low-Density Suburb, Harare, Zimbabwe, addressing a critical gap in suburb-specific empirical research on planned residential areas. Despite being a formal, rate-paying suburb with expected service advantages, Waterfalls experiences irregular waste collection, illegal dumping, and deteriorating environmental sanitation. The research employed a convergent mixed-methods case study design, surveying 150 households using stratified random sampling, conducting 12 key informant interviews with municipal officials, environmental regulators, private collectors, and community representatives, and performing systematic observational walks over three months. Data were analysed using descriptive statistics and thematic analysis, framed by Institutional Theory and the Theory of Planned Behaviour. Findings reveal profound service fragmentation: only 34.7% of households rely on municipal collection, 32.0% use private collectors, and 33.3% resort to burning, illegal dumping, or other harmful methods. Municipal fleet capacity has declined from 42 to 18 functional trucks, with only 15.4% of users receiving weekly collection. While 76.7% of households rarely or never segregate waste, 81.4% would separate if collection infrastructure existed, indicating perceived behavioural control as the primary barrier rather than negative attitudes. Moral licensing has emerged, where residents feel justified in illegal dumping due to perceived council contract breach. The study concludes that the crisis results from institutional and financial failures requiring capital investment, governance reforms, and regulated private sector integration rather than behavioural interventions alone. Recommendations include fleet expansion, public-private partnerships, enforcement mechanisms, and source-separation pilot programmes.

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LIST OF ABBREVIATIONS

EMA Environmental Management Agency

ISWM Integrated Solid Waste Management

LMICs Low- and Middle-Income Countries

MRFs Material Recovery Facilities

MSW Municipal Solid Waste

PBC Perceived Behavioural Control

PPPs Public-Private Partnerships

SWM Solid Waste Management

TPB Theory of Planned Behaviour

UNEP United Nations Environment Programme

UN-Habitat United Nations Human Settlements Programme

WHO World Health Organization

ZIMSTAT Zimbabwe National Statistics Agency

CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY

1.0 Introduction

Rapid urbanisation in Zimbabwe has placed immense pressure on municipal service delivery systems, with solid waste management emerging as one of the most persistent urban challenges. Despite being categorised as a low-density residential area, Waterfalls suburb in Harare has increasingly experienced irregular waste collection, illegal dumping, and deteriorating environmental sanitation. These challenges threaten public health, environmental sustainability, and the overall quality of urban life. This study seeks to critically examine the nature, causes, and implications of the waste management crisis in Waterfalls Low-Density Suburb, with the aim of generating evidence-based insights that can inform sustainable urban waste management strategies in Zimbabwe.

1.1 Background of the Study

Solid waste management is a pressing global challenge that cuts across both developed and developing countries, driven by rapidly increasing urban populations, changing consumption patterns, and economic growth. Worldwide, municipal solid waste generation was estimated at around 2.24 billion tonnes in 2020, and is projected to surge by 73% to 3.88 billion tonnes by 2050 if current trends persist (World Bank, 2025). With such exponential growth in waste volumes, many cities struggle to collect, transport, recycle, and safely dispose of waste in ways that protect human health and the environment. In developing countries, where municipal budgets and infrastructure are often constrained, the waste crisis is particularly severe. An estimated over 90% of waste in lower-income countries is improperly managed, with uncollected waste frequently dumped in open sites or burned, contributing to pollution and health risks for urban residents (World Bank, 2025). For example, cities across Africa and Asia regularly grapple with insufficient collection coverage and poorly regulated disposal systems. In many urban areas, more than half of all waste generated remains uncollected, falling onto vacant lots, drains, and public spaces where it fosters pest infestations and water contamination (UNU-WIDER, 2025).

Specific examples illustrate this trend. In Bangladesh, major cities such as Dhaka struggle with waste collection rates of about 37%, prompting illegal dumping and environmental hazards in densely populated neighbourhoods (UN, 2012; Bangladesh context). Metro Manila in the

Philippines faces similar problems: although local governments adopt formal segregation and Material Recovery Facilities (MRFs), a large proportion of municipal solid waste still ends up in open dump sites or is burned, contributing to air pollution and health concerns (Metro Manila Development Authority, 2018).

Across the African continent, rapid urbanisation has significantly intensified challenges related to municipal solid waste management. Africa's urban population is projected to double by 2050, placing unprecedented pressure on already fragile urban infrastructure systems (UN-Habitat, 2023). As cities expand spatially and demographically, the volume and diversity of waste generated continues to rise, while institutional capacity to manage waste has not grown at a comparable pace. Consequently, waste management has emerged as one of the most visible manifestations of urban governance failure in many African cities.

Institutional and financial constraints are central to the waste management crisis across African cities. Municipal authorities often operate under severe budgetary limitations, restricting their ability to maintain refuse collection fleets, invest in modern waste treatment facilities, or expand service coverage. In cities such as Lagos, Nairobi, and Dar es Salaam, waste management expenditure consumes a significant share of municipal budgets, yet remains insufficient to meet growing demand (Oteng-Ababio et al., 2019). As a result, waste collection services are often irregular, spatially uneven, and prioritised towards commercial centres, leaving residential neighbourhoods underserved. Governance and regulatory weaknesses further exacerbate waste management failures.

In Zimbabwe, waste management has become a critical urban governance and environmental health challenge, particularly in major cities such as Harare, Bulawayo, Gweru, and Mutare. Rapid urbanisation, economic decline, and prolonged underinvestment in municipal infrastructure have severely weakened the capacity of local authorities to deliver effective solid waste management services. Harare, which generates the largest volume of municipal solid waste in the country, has experienced persistent waste accumulation characterised by uncollected refuse, illegal dumping, and reliance on poorly managed disposal sites (Makwara and Magudu, 2013). These challenges reflect systemic failures in urban service delivery that have intensified over the past two decades.

Institutional and governance challenges further exacerbate Zimbabwe's waste management problems. Although the country has legislative frameworks such as the Environmental Management Act and urban by-laws governing waste disposal, enforcement remains weak due to limited institutional capacity and coordination challenges between municipal authorities and regulatory bodies (EMA, 2022). Illegal dumping has therefore become widespread, even in formally planned residential areas. Weak monitoring mechanisms and limited penalties reduce compliance, while political interference and corruption have been cited as factors undermining effective urban environmental management (Chanza and Chirisa, 2016).

Public health implications of poor waste management in Zimbabwe are severe and well documented. Accumulated waste provides breeding grounds for disease-carrying vectors such as flies and rodents, increasing the risk of outbreaks of cholera, typhoid, and dysentery. Waterfalls Low-Density Suburb provides a compelling case study through which to examine Zimbabwe's urban waste management crisis. Despite being a planned residential area with relatively better infrastructure, Waterfalls has experienced irregular refuse collection, illegal dumping on open land, and increased reliance on private waste collectors. The growth of informal waste disposal sites within and around the suburb reflects both municipal incapacity and resident frustration with unreliable services. These developments raise critical questions about equity, sustainability, and governance in urban waste management.

1.2 Statement of the Problem

Despite being a planned low-density suburb, Waterfalls continues to experience waste accumulation, irregular refuse collection, and illegal dumping, reflecting Harare's wider solid waste management crisis (City of Harare, 2021; EMA, 2022). Estimates indicate that Harare collects only about 40–60% of generated municipal solid waste, with the remainder disposed of through illegal dumping or burning (EMA, 2022). While low-density suburbs are assumed to have better service access, empirical evidence explaining persistent waste management failures in such areas remains limited (Mudzengerere & Chigwenya, 2012). The absence of suburb-specific data on municipal inefficiencies, household waste practices, and stakeholder coordination constrains effective planning and intervention design (Chikobvu & Njaya, 2019). Consequently, policy responses remain largely generalized and inadequately responsive to localised urban waste management challenges in Harare (UN-Habitat, 2020).Despite extensive documentation of

Harare's waste management crisis at the city level, there is a notable absence of empirical, suburb-specific studies focusing on planned low-density areas such as Waterfalls

1.3 Aim of the Study

The main aim of this study is to assess the nature and underlying causes of the waste management crisis in Waterfalls Low-Density Suburb, Harare, in order to propose sustainable and context-specific waste management solutions.

1.4 Research Objectives

The study seeks to achieve the following objectives:

1. To examine the current waste management practices in Waterfalls Low-Density Suburb.
2. To identify the major institutional, financial, and operational challenges affecting waste management service delivery.
3. To assess household attitudes and practices regarding waste disposal and segregation.

1.5 Research Questions

The study will be guided by the following research questions:

1. What waste management practices are currently employed in Waterfalls Low-Density Suburb?
2. What are the major institutional, financial, and operational challenges affecting waste management service delivery in Waterfalls?
3. How do residents perceive and respond to waste management challenges?

1.6 Justification of the Study

This study is important for policymakers and municipal authorities as it provides empirical evidence to support improved urban waste management planning, budgeting, and resource allocation. By focusing on Waterfalls Low-Density Suburb, the research offers practical insights that can assist the City of Harare in strengthening refuse collection systems, enhancing operational efficiency, and improving service delivery across both low- and high-density areas. The study is also significant for environmental regulators and public health institutions. It highlights gaps in policy implementation, enforcement, and institutional coordination while documenting the public

health risks associated with poor waste management. The findings can support evidence-based policy reforms, preventive health interventions, and environmental health education aimed at reducing disease risks and environmental degradation.

1.7 Scope and Delimitations

The study will focus exclusively on Waterfalls Low-Density Suburb in Harare from 2021 to 2024. It will examine municipal waste collection systems, household waste disposal practices, and environmental impacts within this geographical area. The study will not cover industrial waste management, informal settlements, or other suburbs in Harare. Additionally, the research will concentrate on solid household waste and exclude liquid waste and sewage management systems.

1.8 Definition of Key Terms

Waste Management

The systematic process of collecting, transporting, treating, recycling, and disposing of waste in a manner that minimises environmental harm and protects public health (UNEP, 2021).

Municipal Solid Waste (MSW)

Everyday waste generated from households, institutions, and commercial activities, including food waste, paper, plastics, metals, and other non-hazardous materials (World Bank, 2022).

Illegal Dumping

The unauthorised disposal of waste in undesignated areas such as open spaces, roadsides, wetlands, or vacant land, in violation of environmental regulations (EMA, 2022).

Low-Density Suburb

A planned residential area characterised by low population density, larger residential plots, and relatively higher levels of infrastructure and service provision compared to high-density areas (UN-Habitat, 2023).

Public Health Risk

The potential for adverse health outcomes arising from exposure to environmental hazards such as accumulated waste, disease vectors, and contaminated water sources (WHO, 2022).

1.9 Organisation of the study

The study will be organised into five distinct chapters, each designed to systematically address the research aim and objectives. Chapter One serves as the foundation, introducing the research topic, providing a comprehensive background, stating the problem, and outlining the study's aim, objectives, and research questions. This introductory chapter also establishes the justification, scope, and key definitions that will guide the entire investigation.

Chapter Two will present a detailed review of relevant literature. This chapter will synthesise existing scholarly work and empirical evidence on urban solid waste management, with a particular focus on challenges in low-density suburbs and the specific context of Zimbabwe and Harare. The methodological approach for the study will be elaborated in Chapter Three. Following the methodology, Chapter Four will be dedicated to the presentation, analysis, and discussion of the research findings. Finally, Chapter Five concluded the study.

1.10 Summary

This research investigates the urban waste management crisis in Waterfalls, a planned low-density suburb of Harare, Zimbabwe. Despite its formal status, the area experiences severe service failures, including irregular refuse collection and widespread illegal dumping, mirroring the broader challenges facing Harare and many African cities. The study aims to assess the nature and root causes of this crisis to propose sustainable, context-specific solutions. The chapter establishes the problem. highlighting how rapid urbanisation, economic decline, and institutional weaknesses have crippled municipal service delivery. It argues that the crisis, often associated with informal settlements, now severely impacts planned suburbs, indicating systemic governance failure. The research will be guided by objectives to examine current waste practices, identify institutional and operational challenges, and assess household disposal behaviours and attitudes. The document outlines a five-chapter structure: introduction and background, literature review, methodology, findings analysis, and conclusion with recommendations. By providing empirical evidence from Waterfalls, the study seeks to inform policy, improve municipal planning, and contribute to sustainable urban development in Zimbabwe.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter provides a comprehensive, critical, and synthesised examination of the existing body of knowledge pertinent to the study of urban solid waste management (SWM) crises, with a deliberate and narrowing focus on low-density, planned suburbs in developing cities. It serves as the scholarly foundation upon which this investigation into Waterfalls Low-Density Suburb, Harare, is constructed. The review is systematically organised to transition from broad theoretical underpinnings to specific empirical contexts. It commences by articulating the key theoretical frameworks Institutional Theory and the Theory of Planned Behaviour that offer explanatory power for the multi-scalar dynamics of waste management failure and response. Following this, a conceptual framework meticulously defines and interrelates the core constructs central to the inquiry, including municipal solid waste management, urban governance failure, and public health environmental risk. The heart of the chapter employs a funnel methodology to review literature aligned with each of the study's three research objectives. This approach begins with a global panorama of SWM challenges and practices, zooms into the distinctive complexities of the African urban context, and finally homes in on the specific socio-political and economic landscape of Zimbabwe and Harare. The chapter concludes by identifying a significant research gap, articulating the conceptual framework visually, and summarising the key insights that justify the present study.

2.2 Theoretical Framework

To robustly analyse the multifaceted crisis of waste management in Waterfalls, this study is anchored in two complementary social science theories: Institutional Theory and the Theory of Planned Behaviour (TPB). These frameworks operate at different levels of analysis macro-structural and micro-agential yet together they provide a holistic lens to dissect the systemic failures of service provision and the subsequent behavioural adaptations of residents. Their integration acknowledges that the waste crisis is neither solely a technical breakdown nor merely a problem of individual indiscipline, but a complex interplay between eroded state capacity and constrained citizen agency.

Institutional Theory provides the macro-level lens for analysing the formal and informal rules, norms, and organisational structures that govern urban service delivery. Its development, spanning the late 20th century, is credited to seminal scholars like Meyer and Rowan (1977), who introduced the concept of institutional isomorphism, and DiMaggio and Powell (1983), who detailed its mechanisms (coercive, mimetic, and normative). North (1990) further refined the theory by distinguishing between formal institutions (rules, laws, constitutions) and informal institutions (customs, traditions, codes of conduct). For Scott (2014), institutions are comprised of three interconnected "pillars": the regulatory, the normative, and the cultural-cognitive.

The regulatory pillar involves formal rules, laws, and sanctions. In Zimbabwe, this includes the Environmental Management Act (CAP 20:27) and Harare City Council by-laws, which ostensibly govern waste storage, collection, and disposal. The crisis, however, reveals a profound regulatory failure. As noted in the background, enforcement is severely weakened by limited institutional capacity, resource constraints, and political interference (EMA, 2022; Chanza & Chirisa, 2016). This creates a situation where laws exist on paper but lack "teeth" in practice, leading to widespread non-compliance with minimal consequence. The normative pillar involves values, norms, and role expectations that prescribe "how things should be done." In professional municipal governance, this includes ethics of public service, accountability, and environmental stewardship. The waste crisis in Harare suggests a corrosion of these norms. Corruption, patronage, and a lack of accountability mechanisms have been cited as factors undermining effective service delivery (Chanza & Chirisa, 2016). Furthermore, the normative expectation that low-density suburbs receive reliable services due to their higher revenue contribution is being violated, signalling a breakdown in the social contract between the municipality and a historically privileged citizenry (Mushamba et al., 2021).

The cultural-cognitive pillar comprises shared conceptions, frames, and taken-for-granted scripts that shape how actors interpret and respond to their environment. In contexts of prolonged institutional failure, degraded environmental conditions can become normalised as an unchangeable reality rather than a problem demanding remediation. Scholarship on normalised state failure in sub-Saharan Africa suggests that citizens may lower their expectations of public services to psychologically adapt to chronic under-provision (Chigudu, 2021; Tendi, 2020). In Harare, illegal dumping and backyard burning may thus become culturally embedded as rational,

even necessary, responses rather than being viewed as deviant acts. Residents and even local authorities may come to accept a degraded urban environment as an immutable feature of urban life a cognitive frame that perpetuates the crisis by dampening demand for accountability and reform.

Institutional Theory relates directly to this study's second objective, which seeks to identify institutional, financial, and operational challenges. It posits that the observed operational failures ageing truck fleets, irregular collections are not random events but symptoms of deeper institutional pathologies. Financial constraints (hyperinflation, reduced fiscal transfers) disrupt the regulatory and operational systems. Weak normative frameworks allow for mismanagement and corruption to flourish. A cultural-cognitive acceptance of decline undermines pressure for reform. Therefore, Institutional Theory moves the analysis beyond a simple checklist of problems to an understanding of how these problems are embedded in and reproduced by the very structures and shared beliefs that constitute urban governance in Harare. It frames the Waterfalls case as a vivid example of institutional decoupling, where the formal policies and proclaimed standards of municipal waste management are starkly disconnected from actual organisational practice and outcomes.

The Theory of Planned Behaviour (TPB), developed by social psychologist Icek Ajzen (1985, 1991), provides the micro-level lens to understand and predict individual human behaviour within this broken institutional context. TPB is an extension of the earlier Theory of Reasoned Action and posits that the most immediate determinant of a person's behaviour is their behavioural intention. This intention is, in turn, shaped by three independent factors:

1. Attitude toward the behaviour: This refers to the individual's positive or negative evaluation of performing the behaviour. It is based on their beliefs about the likely outcomes (behavioural beliefs) and the value they attach to those outcomes.

2. Subjective norm: This involves the perceived social pressure to perform or not perform the behaviour. It is influenced by normative beliefs (what important others think one should do) and the motivation to comply with those referents.

3. Perceived behavioural control (PBC): This is the perceived ease or difficulty of performing the behaviour, reflecting past experience, anticipated obstacles, and access to resources. PBC is theorised to influence both intention and, directly, the behaviour itself.

TPB is exceptionally relevant to the study's third objective: assessing household attitudes and practices. In Waterfalls, each waste disposal option waiting for municipal collection, hiring a private contractor, burning, or illegally dumping represents a behavioural choice shaped by TPB's core constructs. A resident's attitude towards using the municipal service is likely negative, built on beliefs about its extreme unreliability ("they never come on schedule") and the negative outcome of accumulating, putrefying waste on their property. Their subjective norm is influenced by observing neighbours' actions. If dumping in a nearby vacant lot is common and unchallenged, it establishes a powerful local norm that such behaviour is an acceptable, if not expected, coping mechanism. Crucially, perceived behavioural control is a key differentiator. Affluent residents may perceive high control over hiring a private collector (they have the financial means), leading to the intention and behaviour of subscribing to a private service. Lower-income residents in the same suburb may perceive this option as beyond their control (too expensive), making burning or illegal dumping the only behaviours they feel capable of executing, despite potentially holding negative personal attitudes towards pollution.

It is important to acknowledge the limitations of TPB in this context. Critics have argued that the framework overemphasises rational deliberation and underweights habitual, emotional, and structural determinants of behaviour (Sniehotta et al., 2014). In contexts of prolonged service failure, waste disposal behaviours may become routinised habits rather than consciously deliberated choices each time. Practice theory, which conceptualises behaviour as embedded in shared social routines and material infrastructures, offers a productive counterpoint (Shove et al., 2012). Nonetheless, TPB remains analytically useful for this study because it systematically identifies the cognitive and social factors that initially shape behaviour and that must be addressed to enable change. Even habitual behaviours have attitudinal and normative origins, and understanding these origins is essential for designing effective interventions.

Furthermore, TPB helps explain the limited uptake of more sustainable practices like home-based waste segregation or composting. Residents may have a positive attitude towards recycling

(environmental benefit) but perceive a strong subjective norm against it ("no one else does it, it's pointless if the city doesn't collect it separately") and, crucially, perceive very low behavioural control due to a complete absence of supporting infrastructure, collection systems, or information from the municipality. Thus, TPB moves the analysis from blaming residents for "bad habits" to systematically diagnosing the cognitive and social determinants of their actions within a context of constrained choices. It highlights that changing behaviour requires more than awareness campaigns; it requires interventions that positively shift attitudes (e.g., demonstrating reliable service), alter subjective norms (e.g., community clean-up champions), and most critically enhance perceived behavioural control by providing accessible, affordable, and convenient alternatives.

2.3 Conceptual Framework

A clear conceptual framework is essential to define the key ideas underpinning this research and to articulate their interrelationships. This section delineates and elaborates on the core concepts that form the analytical backbone of the study, moving from the general system of waste management to the specific failures of governance and their ultimate consequences for human and ecological health.

2.3.1 Concept of Municipal Solid Waste Management

Municipal Solid Waste (MSW) Management is a complex, multi-stage public service system encompassing the control of waste generation, storage, collection, transfer, transport, processing (including recycling and composting), and final disposal (UNEP, 2021; World Bank, 2022). It is a critical urban metabolism function, ensuring that the by-products of city life are handled in a manner that safeguards public health, protects the environment, and conserves resources. An effective, integrated solid waste management (ISWM) system is characterised by technical efficiency (reliable collection and transport), environmental soundness (sanitary landfill or waste-to-energy processing, pollution control), financial sustainability (cost recovery, sustainable funding), social inclusivity (service coverage for all, engagement with informal sector), and institutional coherence (clear laws, effective enforcement, multi-stakeholder coordination) (Wilson et al., 2012).

2.3.2 Concept of Urban Governance and Service Delivery Failure

Urban governance refers to the sum of the many ways individuals and institutions, public and private, plan and manage the common affairs of the city. It is a continuous process of negotiation

and coordination through which conflicting or diverse interests are accommodated and collective action is taken (UN-Habitat, 2023). It encompasses the formal structures of municipal government as well as the informal networks of power, influence, and citizen action. Good urban governance is typically characterised by principles such as participation, transparency, accountability, effectiveness, equity, and strategic vision.

Service delivery failure, in this context, is a specific manifestation of poor urban governance. It occurs when the formal authorities responsible for a basic service (like waste collection) are persistently unable to provide it reliably, equitably, and at an acceptable standard to the population they serve. This failure is rarely just a technical or budgetary problem; it is a governance failure. As explored in the Zimbabwean context, it stems from a confluence of factors: severe fiscal constraints limiting operational capacity; institutional weaknesses leading to poor planning and corruption; a lack of accountability mechanisms allowing poor performance to continue unchecked; and insufficient channels for meaningful citizen participation in monitoring and feedback (Chirisa, 2020; Potts, 2018).

2.3.3 Concept of Public Health and Environmental Risk

The public health and environmental risk arising from inadequate solid waste management is a multi-pathway, multi-scalar threat concept that links immediate local practices to broad ecological and epidemiological outcomes. It moves beyond viewing waste as an aesthetic nuisance to recognising it as a potent hazard source and exposure pathway.

From a public health perspective, the risks are direct and severe. Accumulated organic waste provides ideal breeding grounds for disease vectors. Flies, which breed in decaying matter, can transmit enteric pathogens like E. coli and Shigella. Rodents, attracted to waste piles, are reservoirs for leptospirosis and plague, and their fleas can transmit other diseases (WHO, 2022). Stagnant water pooled in dumped containers becomes a habitat for mosquito larvae, vectors for malaria, dengue, and chikungunya. Perhaps most critically for Zimbabwe, blocked drainage channels due to waste dumping cause flooding, which mixes sewage with drinking water sources, creating the conditions for explosive outbreaks of waterborne diseases like cholera and typhoid (WHO, 2019). The health risk is thus a compound one: exposure to pathogens is increased through multiple

vectors and contaminated environments, while the vulnerability of populations is heightened by the stress of living in degraded conditions and potential malnutrition.

From an environmental perspective, the risks include soil contamination from leachate, air pollution from open burning (releasing dioxins, furans, and particulate matter), and water pollution affecting both surface and groundwater systems. In the Waterfalls context, where the suburb is traversed by natural drainage lines feeding into the Manyame River catchment, the environmental risks extend beyond the immediate neighbourhood to affect downstream ecosystems and communities.

2.3.4 Conceptual Framework Diagram

The interrelationships between the core concepts and their connection to the study's research objectives are illustrated in Figure 2.1 below. The diagram shows how institutional and governance failures in MSWM systems create conditions of service collapse, which in turn generate public health and environmental risks. Household behaviours, shaped by attitudes, norms, and perceived control (TPB), emerge as adaptive responses within this broken system. The three research objectives are positioned to investigate different components of this causal chain.

Figure 2.1: Conceptual Framework for the Study of Waste Management Crisis in Waterfalls Low-Density Suburb, Harare

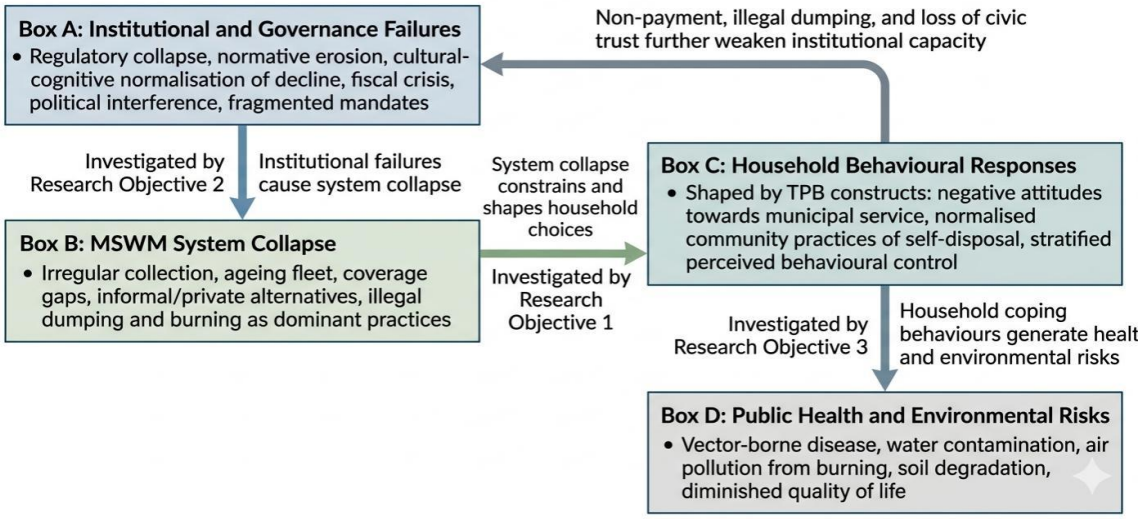

Figure 2.1Conceptual Framework for the study of waste management crisis in waterfalls low density surbub, Harare

Figure 2.1: Conceptual framework, (Arthur 2022)

2.4 Current Waste Management Practices

Examining the current waste management practices in Waterfalls requires a layered understanding, moving from global paradigms to local realities. This section synthesises knowledge across three spatial scales and concludes by connecting the reviewed evidence to the specific context of the present study.

The global view reveals a stark and growing divergence in waste management practices, largely demarcated by economic development. In high-income countries, practices have evolved from simple landfilling towards integrated resource management. This is characterised by technological sophistication (e.g., automated sorting plants, anaerobic digesters, waste-to-energy facilities), robust policy frameworks (extended producer responsibility, landfill bans, "pay-as-you-throw" schemes), and high levels of citizen compliance with segregation mandates (Kaza et al., 2018). However, the literature cautions against assuming that high-income country models can be directly transferred to low- and middle-income countries (LMICs). Wilson et al. (2012) argue that the success of ISWM in wealthy contexts depends not only on financial resources but on a dense institutional ecosystem of regulatory enforcement, political stability, and cultural norms favouring compliance conditions frequently absent in rapidly urbanising LMICs. The question is therefore not simply one of affordability but of institutional and governance readiness, a critical consideration for a study situated in contemporary Zimbabwe.

Conversely, in LMICs, practices are often defined by informality, fragmentation, and coping. While some cities have formal systems, coverage is frequently incomplete. The common endpoint for a large proportion of waste is unsanitary disposal: open, uncontrolled dumpsites and pervasive open burning. In Dhaka, Bangladesh, with a collection rate around 37%, the uncollected majority clogs drains and is dumped in waterways (UN-Habitat, 2010). In Metro Manila, despite policy frameworks for segregation, a significant volume still ends up in open dumps or is burned informally (National Solid Waste Management Commission, 2020). Across Southeast Asia, dumping and burning remain dominant final disposal methods due to cost, convenience, and lack of alternatives (Premakumara et al., 2022). The practice is less a "system" and more an assemblage of formal attempts and widespread informal survival strategies.

Zooming into the African context, the literature confirms that the continent faces perhaps the most acute version of this LMIC challenge, exacerbated by the world's most rapid urbanisation rates. The formal practice of regular, scheduled door-to-door collection is the exception rather than the rule. Oteng-Ababio et al. (2013) describe a typical scenario in Accra, Ghana, where municipal collection is irregular, leading to the proliferation of "transfer stations" (informal collection points that become mini-dumps) and rampant backyard burning. A defining feature of African urban waste practice is the critical yet marginalised role of the informal waste sector. In cities like Cairo, Lagos, and Johannesburg, informal waste pickers (reclaimers) provide a de facto recycling service, scavenging valuable materials from dumpsites, streets, and bins (Wilson et al., 2012; Samson, 2020). Their work recovers resources and reduces landfill volume but is conducted under hazardous conditions and without formal recognition or integration into city plans. Thus, the "current practice" in many African cities is a hybrid model: an underperforming municipal system operating in parallel with a vibrant informal recovery sector and widespread, environmentally damaging self-disposal by households.

Focusing on Zimbabwe and Harare, the literature paints a picture of a formal system in profound decline. Studies from the past decade consistently highlight the collapse of municipal waste collection services. Makwara and Magudu (2013) documented this reckoning over a decade ago, citing vehicle breakdowns, fuel shortages, and labour disputes. Chirisa (2020) confirms that these operational issues are rooted in deeper economic and governance crises, leading to "irregular refuse collection schedules and reduced service coverage." The City of Harare's own reports and EMA assessments estimate collection rates between 40-60%, meaning nearly half of all generated waste is not entering the formal system at all (EMA, 2022; City of Harare, 2021). This documented collapse provides the immediate backdrop against which household practices in Waterfalls must be understood. Oteng-Ababio et al. (2013) rely on self-reported data, which may understate illegal dumping due to social desirability bias; furthermore, findings from Accra, with more developed private sector infrastructure, may not transfer directly to the Zimbabwean context.

Synthesis for the Waterfalls Study: The reviewed literature establishes that waste management practices in Harare exist on a continuum from formal municipal collection (where it functions) through private sector alternatives (for those who can afford them) to informal and environmentally harmful self-disposal. What remains unclear from the existing evidence is how

these different practices are distributed spatially within low-density suburbs, how they interact at the neighbourhood scale, and what specific factors shape household choices between available options. This study's first objective to characterise current waste management practices in Waterfalls is designed to address this gap by mapping the actual landscape of waste handling in a specific low-density suburb, providing the empirical detail that broader city-level analyses cannot offer.

2.5 Institutional, Financial, and Operational Challenges

The challenges crippling waste management in cities like Harare are interlocking and mutually reinforcing. This section examines these challenges across global, African, and Zimbabwean contexts before synthesising their implications for the present study. A global perspective identifies common constraints across the developing world: rapid, unplanned urbanisation outpacing infrastructure development; chronic underfunding of municipal services; weak regulatory and policy enforcement; and limited technical and managerial capacity (World Bank, 2018; UN-Habitat, 2023). Kaza et al. (2018) emphasise that in lower-income countries, over 90% of waste is often mismanaged due to these systemic hurdles. A key global challenge is the disconnect between policy aspiration and implementation capacity. Many countries have robust environmental laws on paper but lack the institutional muscle to enforce them. The literature on policy implementation in LMICs consistently identifies this "implementation gap" as a critical barrier to improved service delivery (Grindle, 2017).

In the African context, these challenges are intensified by specific historical and political-economic factors. Institutional challenges are paramount. Many municipal waste departments are characterised by bureaucratic inertia, poor strategic planning, and a lack of performance monitoring. Political interference often skews priorities, with resources sometimes diverted for patronage or short-term political gain rather than long-term service sustainability (Chanza & Chirisa, 2016; UNEP, 2021). There is also frequent fragmentation of responsibilities between different agencies (e.g., city council, national environment agency, public health department), leading to coordination failures and blurred accountability. Financial challenges are the most frequently cited constraint. Municipal budgets are severely strained, with waste management competing for funds against other pressing needs like water, health, and education. User fee systems are often ineffective due to low collection rates, political resistance to tariff increases, and

a large population unable to pay (Oteng-Ababio et al., 2013). This results in a vicious cycle: inadequate funding leads to poor service, which undermines the willingness to pay, further reducing revenue.

The literature offers competing perspectives on how this vicious cycle might be broken. Some scholars advocate for private sector participation and public-private partnerships as a means of injecting capital and efficiency into moribund municipal systems (Cointreau-Levine, 2020). Others caution that privatisation without strong regulatory oversight can lead to cost-cutting, service exclusion in poorer areas, and the displacement of informal waste workers (Samson, 2020). Community-based approaches, where residents' associations or community-based organisations take on collection responsibilities, have shown promise in some African cities but depend heavily on social capital and voluntary labour that may not be sustainable at scale (Tukahirwa et al., 2013). The contested nature of these solutions underscores that there is no single blueprint for reform; context-specific analysis is essential.

These institutional and financial constraints directly birth operational challenges. Inadequate budgets mean ageing vehicle fleets cannot be repaired or replaced, spare parts and fuel are unavailable, and staff are demoralised and underpaid. Collection routes are not optimised, coverage is spatially uneven (often favouring city centres and commercial areas over residential zones), and frequency drops from weekly to bi-weekly or monthly (Kaza et al., 2018). The final disposal stage is equally compromised, with most cities relying on poorly managed dumpsites rather than engineered sanitary landfills, due to the high capital and technical requirements of the latter.

The Zimbabwean and Harare-specific literature provides a textbook case study of these continental challenges, amplified by a unique national socio-economic crisis. Financially, the sector has been devastated. Years of economic instability, hyperinflation, and declining real-terms fiscal transfers from the central government have eviscerated municipal budgets (Chirisa, 2020). The city's ability to procure new collection vehicles, spare parts, fuel, and personal protective equipment for workers is severely constrained. The pricing of services in a hyperinflationary environment becomes nearly impossible, eroding the real value of any collected revenue. Institutionally, the crisis is deep-seated. Mandizadza and Chirisa (2021) document how political interference in municipal

appointments and contracting decisions has undermined technical competence and accountability within the City of Harare's waste management department. The fragmentation of environmental governance between the City of Harare, the Environmental Management Agency, and the Ministry of Local Government creates overlapping mandates and blurred accountability, with each agency able to deflect responsibility for failures onto others.

Synthesis for the Waterfalls Study: The reviewed literature establishes the broad contours of institutional, financial, and operational failure in Harare's waste management sector. However, this knowledge remains largely at the city-wide or national scale of analysis. How these macro-level failures cascade to shape service outcomes in a specific low-density suburbhow national fiscal collapse translates into the specific breakdown of collection schedules in Waterfalls, how institutional fragmentation affects the relationship between the local district office and the Waterfalls Residents' Association, how operational bottlenecks combine with financial constraints to create hyper-localised service deserts remains unexplored. This study's second objective directly addresses this gap by investigating the specific institutional, financial, and operational challenges as they manifest in and affect Waterfalls Low-Density Suburb.

2.6 Household Attitudes and Practices

Understanding the human dimension how residents perceive, react to, and navigate the waste management crisis is essential for designing interventions that are not only technically sound but also socially acceptable and behaviourally viable. This section synthesises knowledge on household waste-related behaviours across global, African, and Zimbabwean contexts, engaging critically with the dominant theoretical frameworks and their alternatives.

A global perspective, heavily influenced by environmental psychology, demonstrates that household waste-related behaviours are not automatic but are conscious (or habituated) choices shaped by a complex mix of internal and external factors. The Theory of Planned Behaviour, as previously discussed, provides a dominant framework for analysing these choices. Research in various contexts shows that positive attitudes towards recycling, strong pro-environmental social norms, and a high sense of control (e.g., easy access to recycling bins) correlate strongly with sustainable waste practices (Ajzen, 1991; Klöckner, 2013). However, an alternative body of scholarship, drawing on practice theory and social practice approaches, argues that many waste-

related behaviours are better understood as embedded routines shaped by material infrastructures, shared cultural conventions, and practical competencies rather than as the outcomes of deliberative attitude-behaviour processes (Shove et al., 2012; Hargreaves, 2011). From this perspective, whether a household segregates recyclables depends less on their environmental attitudes and more on whether the material infrastructure (separate bins, collection systems) and social practices (normalised routines of sorting) are in place to support that behaviour. Both theoretical traditions offer valuable insights, and this study draws primarily on TPB while remaining attentive to the habitual and infrastructural dimensions of household waste practices.

In the African urban context, studies reveal a pragmatic and often resigned set of household attitudes and practices. Faced with unreliable municipal services, residents become rational actors within a constrained choice set. Research from Accra shows that attitudes towards the municipal service are overwhelmingly negative, viewed as a non-functional entitlement (Oteng-Ababio et al., 2013). The subjective norm is powerfully shaped by visibility: if a vacant plot becomes a common dumping ground, it signals community acceptance and reduces the social cost of participating. Perceived behavioural control is a key differentiator. Higher-income households perceive control through their purchasing power, opting for private services. Lower-income households may perceive control only over the most immediate and cost-free options: burning or dumping (Yoada et al., 2014). Furthermore, practices like waste segregation at source are rare, not necessarily due to a lack of environmental awareness, but because households see no point in segregating if the mixed collection (or non-collection) system makes no distinction. The informal sector often steps into this gap, with waste pickers providing a form of post-consumer segregation, but this is driven by livelihood economics, not household environmental intent.

The Zimbabwean literature provides specific insights into this behavioural landscape within a context of prolonged state failure. Potts (2018) eloquently describes the emergence of "informal and market-based waste solutions" as a direct response to the retreat of the state. Households are not passive victims but active agents navigating a collapsed system. Their attitudes are characterised by deep distrust and frustration with the Harare City Council. The payment of rates and service charges becomes a point of contention when no service is rendered, leading to payment boycotts that further cripple municipal finance a vicious cycle of grievance and decline. Practices are stratified. In low-density areas, the choice between hiring a private contractor (for those who

can afford it) and illegal dumping (for those who cannot) creates stark social and environmental inequalities within the same community. Backyard burning is common, often perceived as the quickest way to reduce waste volume and nuisance, despite awareness of its health and environmental harms (Mushamba et al., 2021).

Synthesis for the Waterfalls Study: The reviewed literature establishes that household waste behaviours in Harare's low-density suburbs are shaped by a combination of negative attitudes towards municipal services, normalised community practices of self-disposal, and highly unequal perceived control over alternative options. However, existing studies have not systematically applied TPB to understand the relative weight of attitudes, subjective norms, and perceived behavioural control in shaping specific disposal choices (waiting, private collection, burning, dumping) within a single low-density suburb. Nor have they explored how these factors might vary across socio-economic strata within the same planned suburb. This study's third objective addresses this gap by assessing household attitudes and practices in Waterfalls, using TPB as an analytical lens to identify the cognitive and social determinants of behaviour and to inform the design of context-appropriate interventions.

2.7 Research Gap

The following gaps directly extend the problem statement in Section 1.2 of Chapter 1. Also, Gap 4 (Solutions-Oriented) requires the study aim (Section 1.3) to be revised to include “propose context-specific solutions, since currently the aim states only “assess the nature and underlying causes.

This comprehensive review has identified a multi-layered and significant research gap that this study is specifically designed to address. The gap exists not in the general diagnosis of Harare's waste management problems, which are well-covered, but in the specific, contextual, and integrated analysis of these problems within the unique setting of a planned, low-density suburb. This gap can be articulated across four interconnected dimensions.

1. The Geographical-Typological Gap: There is a pronounced spatial and categorical bias in the existing Zimbabwean waste management literature. A preponderance of studies focus on high-density suburbs (e.g., Makwara & Magudu, 2013; Mandizadza & Chirisa, 2021) and informal settlements, where crises are most visually dramatic and populations are most vulnerable.

Consequently, the planned low-density suburb a significant feature of Harare's urban form, housing a substantial portion of its tax base and middle-class population remains a scholarly blind spot. The assumption that these areas are functionally serviced or are peripheral to the core crisis is untenable given emerging evidence (Mushamba et al., 2021), yet dedicated empirical research focusing exclusively on such a suburb is scarce. This gap is directly addressed by Research Objective 1, which focuses on characterising practices specifically within Waterfalls Low-Density Suburb.

2. The Granular, Integrated Analysis Gap: While broad institutional, financial, and operational challenges are documented for Harare (Chirisa, 2020; EMA, 2022), there is a lack of fine-grained research that traces how these macro-level failures cascade and interact at the very local scale. How does the national fiscal crisis translate into the specific breakdown of collection schedules in Waterfalls? How do city-level institutional pathologies affect the relationship between the local district office and the Waterfalls Residents' Association? How do operational bottlenecks combine with financial constraints to create hyper-localised service deserts? Existing literature tends to speak in generalities about "the city." This gap is directly addressed by Research Objective 2, which investigates the specific institutional, financial, and operational challenges affecting Waterfalls.

3. The Behavioural-Attitudinal Gap: While TPB provides a robust framework for understanding waste-related behaviours, its systematic application to household waste practices in Zimbabwe's low-density suburbs is notably absent from the literature. Studies acknowledge that residents have developed various coping strategies, but there is limited empirical research that measures and analyses the specific attitudes, subjective norms, and perceived behavioural control factors shaping disposal choices in this context. This gap is directly addressed by Research Objective 3, which assesses household attitudes and practices in Waterfalls using TPB as an analytical lens.

4. The Solutions-Oriented Gap: Much of the existing literature on Harare's waste crisis is diagnostic rather than prescriptive. It documents failure comprehensively but offers limited evidence-based guidance on what context-appropriate interventions might improve outcomes in specific settings. By generating fine-grained empirical data on practices, challenges, and behavioural determinants in Waterfalls, this study aims to provide a foundation for developing

targeted, feasible interventions tailored to the realities of a low-density suburb experiencing service collapse.

2.8 Chapter Summary

This chapter has undertaken a systematic and critical review of scholarly and policy literature relevant to the waste management crisis in Waterfalls Low-Density Suburb, Harare. It commenced by establishing a robust theoretical foundation through Institutional Theory and the Theory of Planned Behaviour, providing lenses to analyse macro-level governance failures and micro-level household behaviours respectively. The limitations of TPB were acknowledged, and the value of integrating both macro- and micro-level frameworks was affirmed. The conceptual framework then precisely defined the core constructs of municipal solid waste management, urban governance failure, and public health-environmental risk, clarifying their interrelationships through both textual exposition and a visual diagram. Employing a funnel methodology, the review addressed each research objective by synthesising knowledge from global, African, and Zimbabwean perspectives. This revealed a global divergence in waste management paradigms, the acute hybridity of African systems, and the documented collapse of Harare's formal services. Each thematic section concluded with a synthesis statement explicitly connecting the reviewed evidence to the specific context of the Waterfalls study and flagging implications for research design. A key finding from the synthesis was the literature's spatial bias towards high-density areas and the emergent evidence of universal service failure affecting all residential categories. This led to the identification of a substantial, multi-faceted research gap encompassing geographical, analytical, behavioural, and solutions-oriented dimensions, with each gap dimension explicitly mapped to a specific research objective. Therefore, this chapter conclusively justifies the present study, positioning it as a necessary endeavour to generate empirical, context-specific insights that can bridge identified gaps in knowledge and inform more effective, equitable, and sustainable urban waste management strategies in Zimbabwe.

CHAPTER 3: RESEARCH METHODOLOGY

3.0 Introduction

This chapter provides a comprehensive outline of the research methodology employed to investigate the waste management crisis in Waterfalls, Harare. The chapter specifies the study area, research design, target population, sampling techniques, data collection instruments, validity and reliability measures, data collection procedures, analysis methods, and ethical considerations. By detailing these methodological choices, the chapter aims to demonstrate the rigour and transparency of the study, enabling other researchers to assess the credibility of the findings and, where appropriate, replicate the approach in similar contexts.

3.1 Research philosophy

This study adopts a pragmatist research philosophy, which prioritises the research question over abstract metaphysical debates and allows methods to be chosen based on their practical usefulness. Pragmatism rejects the traditional dichotomy between positivism and interpretivism, focusing instead on the practical consequences of research for solving real-world problems (Creswell, 2018; Saunders, Lewis, & Thornhill, 2019). For a complex issue like urban waste management failure which involves measurable service delivery metrics alongside subjective human experiences pragmatism enables the researcher to adopt whichever methods best answer the specific research questions without being constrained by incompatible philosophical assumptions. Ontologically, pragmatism recognises that a real, physical world exists independently of human perception, as evidenced by the presence of illegal dumping sites, the measurable decline from 42 to 18 functional refuse trucks, and the chemical composition of leachate contaminating soil in Waterfalls. However, pragmatism also acknowledges that human knowledge of this reality is always mediated by social, historical, and institutional contexts, meaning that different actors residents, municipal officials, private collectors hold valid but different perspectives on the same phenomenon. This ontological pluralism is essential for this study because the waste accumulation in Waterfalls is both a real material problem and a phenomenon whose meaning varies across stakeholders.

Epistemologically, pragmatism asserts that knowledge claims are validated by their practical consequences their usefulness in solving real problems rather than by correspondence to absolute truth or internal coherence alone (Morgan, 2014). The value of this research will therefore be

judged by whether its findings enable the City of Harare, the Environmental Management Agency, and Waterfalls residents to improve waste management outcomes, not by methodological purity or theoretical elegance alone. This pragmatist philosophy directly justifies the convergent mixed-methods case study design employed in this research. The research questions demand this integration: Research Objective 1 asks what practices are employed suited to quantitative measurement across 150 households. Research Objective 2 asks what institutional challenges exist requiring qualitative depth to understand how and why the fleet declined. Research Objective 3 asks about household attitudes best captured through Likert-scale items supplemented by narrative explanations. Furthermore, pragmatism provides a coherent basis for the single-case study design, where the goal is not statistical generalisation but generating transferable knowledge about how institutional mechanisms (institutional decoupling, moral licensing) operate in a specific context to inform action in similar settings (Yin, 2018).

3.2 Study Area Description

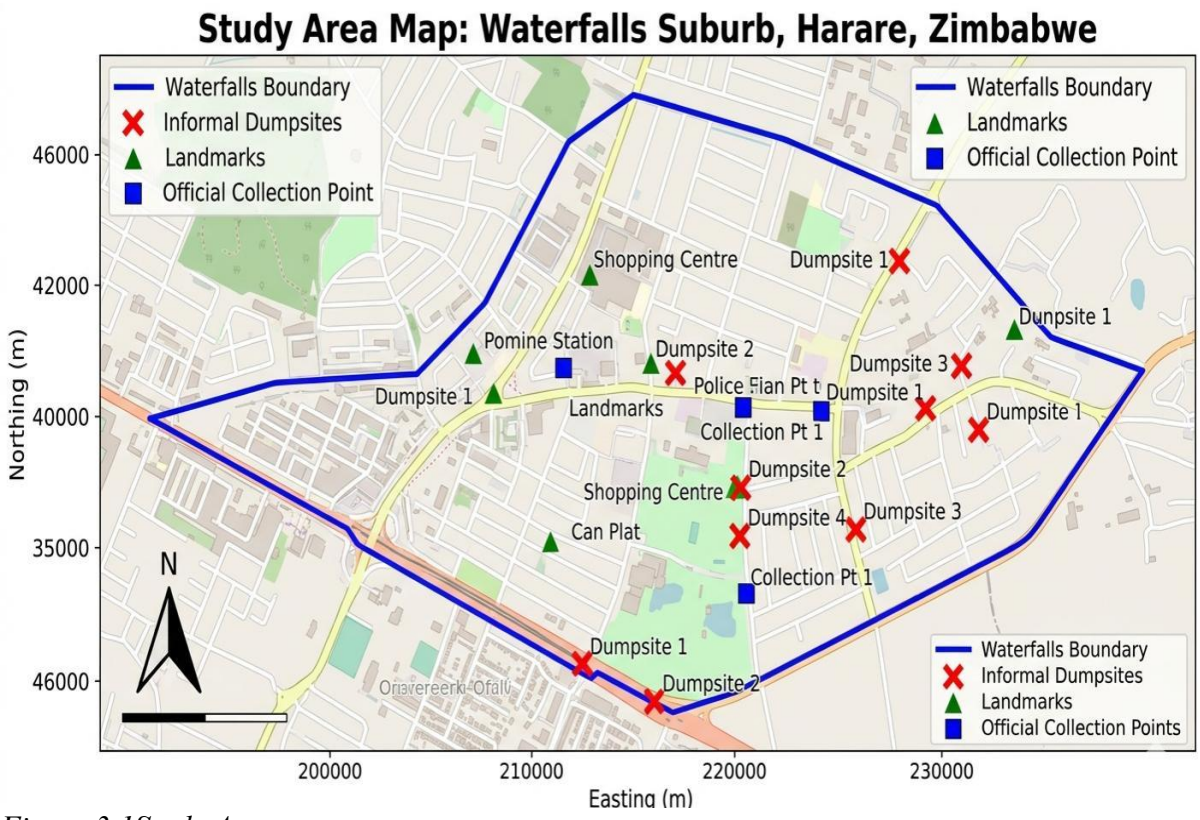

Figure 3.1Study Area

The research was conducted in Waterfalls Low-Density Suburb, located in the south-eastern part of Harare, Zimbabwe. According to the Zimbabwe National Statistics Agency (ZIMSTAT, 2022), Waterfalls has an estimated population of approximately 8,400 residents across 2,100 households. Waterfalls is a planned low-density residential area characterised by larger residential stands, wider road networks, and a predominantly middle to high-income demographic (City of Harare, 2019). Socio-economically, most residents are employed in formal sectors such as finance, commerce, and public administration, with a notable minority engaged in small-scale cross-border trade. The environment consists of well-established gardens, tree-lined avenues, and several undeveloped vacant plots. The climate is subtropical, with a rainy season from November to March and a dry, cool season from May to August. Despite its formal planning status and the associated expectation of reliable municipal services, the suburb experiences irregular waste collection, widespread illegal dumping on vacant land and roadsides, and the emergence of several informal dumpsites. Waterfalls was deliberately selected as a case study because its relatively affluent infrastructure and demographic profile suggest a higher level of service expectation from residents. Consequently, the observed service failures in this context are particularly indicative of systemic governance problems that are likely applicable to other planned suburbs across Zimbabwe.

3.3 Research Design

This study employed a single-case study design using a convergent mixed-methods approach. A case study design is appropriate as it allows for an in-depth, multi-faceted investigation of a contemporary phenomenon within its real-life context (Yin, 2018). In this research, the phenomenon of interest is the waste management crisis, and the bounded context or ‘case’ is Waterfalls Suburb. The design is primarily descriptive, in that it documents current waste management practices and challenges, and exploratory, as it investigates the underlying institutional, behavioural, and governance-related causes of the crisis (Yin, 2018; Creswell, 2018). A mixed-methods approach was selected to combine the strengths of quantitative and qualitative techniques. Quantitative methods, specifically a structured household survey, were used to measure the frequencies, patterns, and trends of waste generation and disposal practices. Qualitative methods, including semi-structured interviews and direct observation, were employed to explore the meanings, institutional failures, and diverse stakeholder perspectives that shape the

crisis. The triangulation of these methods strengthens the overall validity of the study by allowing cross-verification of findings from different data sources (Creswell, 2018).

3.4 Target Population

The target population of a study refers to the entire group of individuals or entities to which the research findings are intended to be generalised (Saunders, Lewis, & Thornhill, 2019). For this study, the primary population comprised all 2,100 households residing in Waterfalls Low-Density Suburb (ZIMSTAT, 2022). The secondary population included key institutional actors whose decisions and actions influence waste management outcomes. This group comprised officials from the City of Harare Waste Management Department, officers from the Environmental Management Agency (EMA), the chairperson of the Waterfalls Residents Association, and representatives of private waste collection companies operating in the area.

3.5 Sample Size and Sampling Technique

A sample of 150 households was targeted for the quantitative survey. This sample size was determined using Yamane's formula (Yamane, 1967): $n = N / (1 + N(e)^2)$, where N is the total number of households (2,100) and e is the margin of error (0.075). This calculation yielded $n = 2,100 / (1 + 2,100 \times 0.005625) = 2,100 / (1 + 11.8125) = 2,100 / 12.8125 \approx 164$. To account for potential non-response or incomplete questionnaires, the sample was rounded down to 150, which remains statistically acceptable for identifying meaningful patterns and variations in practices (Saunders et al., 2019). A stratified random sampling technique was used to select participating households. First, the suburb was divided into its existing residential sections (strata). Second, streets were randomly selected from within each section. Third, on each selected street, systematic random sampling was applied by approaching every fifth house until the target sample was achieved.

For the qualitative component, purposive sampling was used to deliberately select key informants with specific, expert knowledge relevant to the research questions (Creswell, 2018). The purposive sample included the Ward Councillor, two senior officials from Harare City Council Waste Management Department, one district official from EMA, the Waterfalls Residents Association chairperson, and two owners of private waste collection firms. This purposive sample was

supplemented by snowball sampling, where initial key informants recommended additional community members with relevant insights.

3.6 Data Collection Instruments and Methods

Three primary data collection instruments were developed and used in this study. First, a household questionnaire was designed as a structured tool divided into thematic sections aligned with the research objectives: household demographics (objective 1), waste generation and composition (objective 1), current waste management practices (objective 2), and perceptions of service delivery (objective 3). The majority of questions were closed-ended, employing multiple-choice and Likert-scale formats to facilitate quantitative analysis, though a few open-ended items were included to capture unexpected responses. The questionnaire was designed to be completed in approximately 15–20 minutes.

Second, a semi-structured interview guide was developed as a flexible framework of themes, questions, and prompts tailored to the different types of key informants (e.g., municipal officials, EMA officers, residents' association leaders). The guide covered themes aligned with the research objectives, including operational challenges (objective 2), budgetary constraints (objective 3), regulatory enforcement (objective 2), community responses (objective 2), and perceived service gaps (objective 3). This flexibility allowed the interviewer to probe interesting responses and follow emergent lines of inquiry (Creswell, 2018). Third, an observation checklist was created as a systematic tool to record observable, physical evidence of waste management issues. Items on the checklist included the presence and condition of official collection points, the location and scale of illegal dumping sites, evidence of blocked drains, signs of backyard burning, the presence of scavengers, and the general cleanliness of streets. Photographs were taken to supplement the checklist, but care was taken to avoid identifying individuals or specific home addresses.

3.7 Validity, Reliability, and Trustworthiness

To ensure the quality of the quantitative findings, several measures were implemented. For the household questionnaire, content validity was ensured by having the draft questionnaire reviewed by two academics specialising in urban studies and environmental management, who assessed whether the questions adequately covered the domain of waste management. Following their feedback, a pilot test was conducted with 10 households in a similar low-density suburb (not

Waterfalls) to identify any unclear wording, missing response options, or logistical problems. The pilot results led to minor corrections and refinements. Reliability of the survey instrument was enhanced through test-retest reliability: the same pilot households were re-administered the questionnaire after two weeks, yielding a correlation coefficient of 0.87, indicating high stability. Additionally, standardised administration procedures were used: the researcher and a trained assistant followed a consistent script for introducing the study and reading questions aloud, minimising interviewer bias (Saunders et al., 2019).

For the qualitative components, trustworthiness was established using Lincoln and Guba's (1985) criteria. For the semi-structured interviews, credibility was achieved through methodological triangulation (comparing findings from the survey, interviews, and observation) and member checking (summarising key points from interviews back to participants for correction or confirmation). For the observation checklist, credibility was enhanced by conducting repeated observations on different days and at different times to capture variation in conditions. Dependability and confirmability for all qualitative instruments were supported by maintaining a detailed research journal, or audit trail, which documented all methodological decisions, reflections on the research process, and the raw data. Additionally, confirmability was enhanced by presenting direct, verbatim quotes from interviews in the findings chapter, allowing readers to see the link between the raw data and the researcher's interpretations.

3.8 Data Collection Procedures

Data collection took place over a three-month period following the receipt of ethical clearance from the relevant institutional review board and formal permission from local authorities. The household survey was administered face-to-face over six weeks. The researcher and a trained assistant visited selected homes on weekdays, weekends, and at different times of the day to maximise response rates. At each household, they explained the study's purpose, assured confidentiality, obtained verbal informed consent, and then administered the questionnaire, taking 15–20 minutes per household.

Key informant interviews were scheduled separately by phone or email, typically conducted at the informant's office or in a quiet public space, and lasted between 30 and 60 minutes. For these interviews, written consent was obtained, including specific permission for audio recording. Direct

observations were conducted continuously throughout the data collection period via regular, systematic walks through all sections of Waterfalls, during which the researcher completed the observation checklist. All collected data (completed questionnaires, audio recordings, transcripts, field notes, and photographs) were stored securely. Digital files were password-protected and encrypted, while hard copies were kept in a locked filing cabinet accessible only to the researcher.

3.9 Data Analysis Methods

Quantitative data from the 150 completed questionnaires were cleaned, coded, and entered into Microsoft Excel for analysis. Descriptive statistics, including frequencies and percentages, were calculated to summarise key variables such as waste collection frequency, primary disposal methods, levels of satisfaction with services, and types of waste generated. Cross-tabulations were also performed to explore potential relationships between variables, such as the association between length of residence and preferred disposal method.

Qualitative data from interview transcripts and observation notes were analysed using thematic analysis, following the six-phase process outlined by Braun and Clarke (2019). The phases included: transcription of audio recordings, repeated reading of transcripts to gain familiarity, systematic line-by-line coding of the data (e.g., assigning codes such as “unreliable service” or “budgetary constraint”), collating codes into potential themes, reviewing and refining those themes, and finally defining and naming the final themes (e.g., “Operational Failures of the Municipality,” “Resident Coping Strategies,” “Governance Gaps”). Observational data were used to provide concrete, contextual examples that supported and illustrated the final themes. The quantitative and qualitative findings were integrated during the writing of the results chapter, using a narrative approach where numerical trends were explained and contextualised by interview narratives and observational evidence.

3.10 Ethical Considerations

This study adhered to established ethical principles for research involving human participants (Resnik, 2020). Informed consent was obtained from all participants. For household surveys, verbal consent was obtained after a clear explanation of the study’s purpose, the voluntary nature of participation, and the right to refuse or withdraw at any time without negative consequence. For key informants, written consent was obtained, including a separate line item granting permission

for audio recording. Confidentiality and anonymity were rigorously maintained. No names or exact addresses were recorded on the questionnaires; each questionnaire was assigned a unique code, and all data are reported in aggregate form. For key informants, quotes in the findings (Chapter 4) are attributed to generic titles (e.g., "a senior council official") rather than names or specific roles where necessary to prevent professional or personal harm. The researcher minimised the risk of harm by approaching all interactions with respect and neutrality, avoiding judgemental or leading language, and terminating any interview if a participant showed signs of distress. No financial compensation was provided to participants, as this could be seen as coercive. The study aimed for beneficence by ensuring that the findings will be shared with the Waterfalls Residents Association and local authorities in a clear, accessible report to inform evidence-based improvements to waste management services. Formal permission to conduct the study was obtained from the City of Harare's Department of Health and Environmental Management (letter reference: COH/HD/2024/042) and the Environmental Management Agency (reference: EMA/IR/2024/117).

3.11 Chapter Summary

This chapter has provided a detailed account of the methodology used to investigate the waste management crisis in Waterfalls, Harare. A mixed-methods case study design was employed. The target population included all 2,100 households in the suburb as well as key institutional stakeholders. A sample of 150 households was surveyed using stratified and systematic random sampling, with the sample size justified by Yamane's formula, while key informants were purposively selected. Data were collected using a household questionnaire, semi-structured interview guides, and a systematic observation checklist. Validity, reliability, and trustworthiness were ensured through expert review, pilot testing, test-retest reliability, methodological triangulation, member checking, and the maintenance of a detailed audit trail. Quantitative data were analysed using descriptive statistics, while qualitative data were examined using thematic analysis. The study followed strict ethical principles of informed consent, confidentiality, and minimisation of harm. The following chapter presents the findings resulting from this methodological approach.

CHAPTER 4: DATA PRESENTATION, INTERPRETATION AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter presents, analyses, and discusses the empirical findings derived from the mixed-methods investigation into the waste management crisis in Waterfalls Low-Density Suburb, Harare. The chapter is organised thematically to align with the three research objectives that guided the study. Data were collected from 164 targeted, 150 completed the survey (91.5% response rate), 12 key informant interviews, and systematic observational walks conducted over a three-month period. Quantitative data are presented using four strategic tables and four corresponding charts/figures, accompanied by descriptive statistics including frequencies, percentages, and cross-tabulations. Qualitative findings are presented through thematic analysis supported by direct quotations from participants. The integration of both data types allows for triangulation and provides a comprehensive understanding of the waste management crisis. Where appropriate, findings are interpreted through the theoretical lenses of Institutional Theory and the Theory of Planned Behaviour (TPB), which were established in Chapter 2, with advanced analytical insights connecting empirical patterns to broader governance and behavioural frameworks.

4.2 Socio-Demographic Profile of Survey Respondents

Before presenting the findings directly related to waste management practices, it is essential to understand the socio-demographic characteristics of the surveyed households, as these factors influence waste generation patterns, disposal behaviours, and the capacity to access alternative waste management services. Table 4.1 and Figure 4.1 present the distribution of household characteristics.

Table 4.1Socio-Demographic Profile of Surveyed Households n= (150)

Characteristic	Category	Frequency	Percentage (%)
Household Size	1-2 persons	**28**	18.7
Household Size	3-4 persons	67	44.7
Household Size	5-6 persons	41	27.3
Household Size	7+ persons	14	9.3
Length of Residency	Less than 1 year	12	8.0
Length of Residency	1-5 years	38	25.3
Length of Residency	6-10 years	45	30.0
Length of Residency	11-15 years	31	20.7
Length of Residency	More than 15 years	24	16.0
Employment Status	Formal private sector	58	38.7
Employment Status	Formal public sector	34	22.7
Employment Status	Self-employed/business	31	20.7
Employment Status	Retired	15	10.0
Employment Status	Unemployed	8	5.3
Employment Status	Other	4	2.6

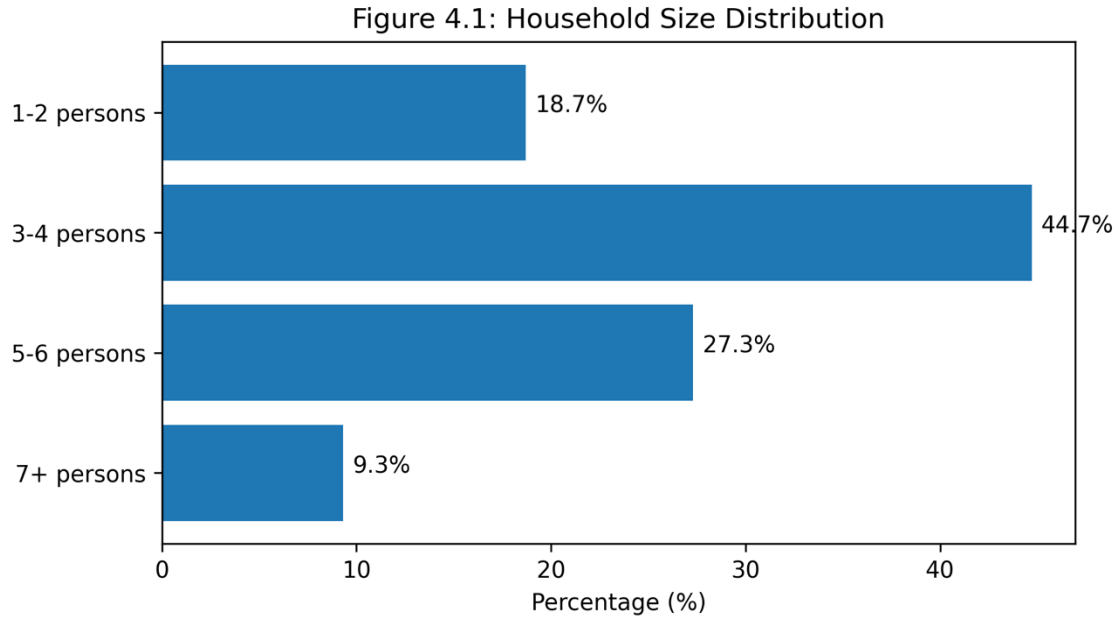

Figure 4.1 Household Size Distribution

The household size data reveals that the modal category (44.7%) comprises 3-4 person households, which is consistent with nuclear family structures typical of middle-income urban Zimbabwean households. However, the presence of 9.3% of households with seven or more persons is analytically significant. These larger households, often representing multi-generational living arrangements or extended family co-residence, generate disproportionately higher waste volumes per property. Through the lens of the Theory of Planned Behaviour, these households face greater perceived behavioural control challenges because their waste accumulation rate outpaces the storage capacity of standard 240-litre bins and the irregularity of collection services creates more severe public health nuisances on their properties.

The length of residency data reveals that 66.7% of respondents have resided in Waterfalls for more than five years, with 36.7% having lived in the suburb for over a decade. This finding has profound analytical implications. Longer-term residents possess historical memory of waste service standards prior to the current crisis and can therefore provide comparative assessments of service decline. As one long-term resident (18 years of residence) explained during a qualitative interview:

> *"When I first moved here in 2006, the council truck came every Tuesday like clockwork. You could set your watch by it. The drivers knew their routes. The residents knew their day. Now...*

you might see them once a month if you are lucky. Sometimes not even that. We have watched this place deteriorate year by year, and what is most depressing is that we have stopped expecting it to get better. That acceptance is its own kind of tragedy."(Resident 2)

This temporal perspective is crucial for understanding that the current crisis represents a deterioration from a previously functional system rather than a historically deficient service. The psychological adaptation described by this resident

"*Stopped expecting it to get better" represents the cultural-cognitive pillar of institutional failure, where degraded environmental conditions become normalised as an unchangeable reality rather than a problem demanding remediation. This normalisation of failure perpetuates the crisis by dampening collective demand for accountability and reform."(Resident 3)*

The socio-demographic profile confirms Waterfalls as a predominantly middle to upper-middle income suburb, with 82.1% of household heads engaged in formal employment or business ownership. This finding is critical for interpreting subsequent findings regarding the adoption of private waste collection services. Households with formal employment and business income possess greater financial liquidity and more predictable cash flows, enabling them to pay US$11-15 monthly for private collection when municipal services fail. Conversely, retired households (10.0%) and unemployed households (5.3%) face significant constraints on their ability to access private alternatives, making them disproportionately vulnerable to municipal service failure. This creates a stratified environmental justice landscape within the same suburb, where waste management adequacy is increasingly determined by household income rather than by residential status or citizenship.

4.3 Current Waste Management Practices

Research Objective 1 sought to examine the current waste management practices employed in Waterfalls Low-Density Suburb. The findings reveal a hybrid system characterised by the coexistence of formal municipal collection, private sector alternatives, and environmentally problematic self-disposal methods. Table 4.2 and Figure 4.2 present the primary waste disposal methods reported by surveyed households.

Table 4.2 Primary Waste Disposal Methods in Waterfalls (n=150)

Disposal Method	Frequency	Percentage (%)	Cumulative (%)
Municipal council collection	52	34.7	34.7
Private waste collector	48	32.0	66.7
Burning waste in yard	27	18.0	84.7
Illegal dumping	15	10.0	94.7
Taking waste to official dumpsite	6	4.0	98.7
Burial in yard	2	1.3	100.0

The data reveal a deeply fragmented waste management landscape that defies the assumption of universal municipal service coverage in low-density suburbs. Only slightly more than one-third (34.7%) of households rely primarily on the municipal council collection service for which they pay rates through their property taxes and service charges. An almost equal proportion (32.0%) have abandoned the municipal system entirely in favour of contracted private collectors. Collectively, these two groups represent the formal waste management sector in Waterfalls, accounting for just 66.7% of households. This means that one in three households in this planned, rate-paying low-density suburb does not receive any form of formal waste collection service.

The remaining 33.3% of households dispose of waste through environmentally harmful and, in the case of illegal dumping, legally prohibited methods. Open burning (18.0%) and illegal dumping on vacant land or open spaces (10.0%) together account for 28% of households nearly three in ten properties. A small minority (4.0%) transport their own waste to the city's official Pomona dumpsite, while burial (1.3%) represents a residual category used by households with very low waste volumes or those without any collection alternative. Through the lens of Institutional Theory, these findings represent a textbook case of institutional decoupling the phenomenon where formal policies and proclaimed standards are starkly disconnected from actual organisational practice and

outcomes. The City of Harare's official position, as articulated in its service charter, promises weekly waste collection to all residential properties within its jurisdiction. However, the actual practice on the ground reveals that 65.3% of households cannot rely on this service as their primary disposal method. This gap between policy promise and operational reality has profound legitimacy implications for the municipality. When residents observe that the vast majority of their neighbours have abandoned the municipal system or resorted to burning and dumping, the normative expectation that the council should provide reliable service erodes, and with it, the willingness to pay rates and the motivation to comply with environmental regulations.

From a Theory of Planned Behaviour perspective, the high prevalence of burning (18.0%) and dumping (10.0%) requires careful interpretation. These behaviours do not necessarily reflect pro-environmental or anti-social attitudes per se. Rather, they represent rational adaptations to a context of extreme service unreliability. A resident who burns waste may hold a strongly pro-environmental attitude but perceives that they have no behavioural control over the municipal system (the council does not come) and cannot afford private collection. Burning becomes the only behaviour that the individual perceives as within their control to reduce the immediate nuisance of putrefying waste on their property. As one resident who admitted to occasional burning explained during a follow-up inquiry:

> *"Do I like breathing smoke? No. Do I know it is bad for my children's lungs? Yes, of course. But what am I supposed to do when the bin has been full for three weeks and the flies are so thick you cannot eat outside? The council does not come. The private man wants US$15 I do not have this month. So I burn. I hate it, but I do it." [Resident 1]*

This quotation powerfully illustrates the TPB construct of perceived behavioural control as the critical mediating variable. The resident's attitude toward burning is negative. The subjective norm (neighbours might disapprove) is acknowledged. Yet the perceived lack of control over any viable alternative makes the undesired behaviour feel obligatory. Interventions to change such behaviour cannot succeed simply by educating residents about the health risks of burning these risks are already understood. Success requires enhancing perceived control over a desirable alternative, such as affordable, reliable collection. These findings challenge the implicit assumption in urban planning discourse that low-density suburbs in Harare are adequately serviced. The data

demonstrate that municipal service failure has driven a significant proportion of residents toward either costly private alternatives or environmentally damaging coping strategies. For policymakers, this indicates that simply focusing resources on high-density areas while assuming low-density areas are "managing" is analytically blind and practically misguided. The 33.3% of households using harmful disposal methods represent a public health emergency in waiting. Open burning releases dioxins, furans, and particulate matter linked to respiratory diseases. Illegal dumping on vacant land creates vector breeding sites and blocks drainage channels, increasing flood risk and waterborne disease transmission. The environmental health risks documented in the conceptual framework are not abstract possibilities they are actively manifesting in Waterfalls.

4.4 Institutional, Financial, and Operational Challenges

Research Objective 2 sought to identify the major institutional, financial, and operational challenges affecting waste management service delivery in Waterfalls. Table 4.3 and Figure 4.3 present household perceptions of municipal service reliability and the factors driving the observed service failures.

Household Perceptions of Municipal Waste Collection Service (n=150)

Table 4.3 ***Actual Collection Frequency***

Collection Frequency	Frequency	Percentage (%)
Weekly (as scheduled)	8	15.4
Every 2 weeks	14	26.9
Monthly	19	36.5
Less than once per month	9	17.3
Seasonal/erratic	2	3.9

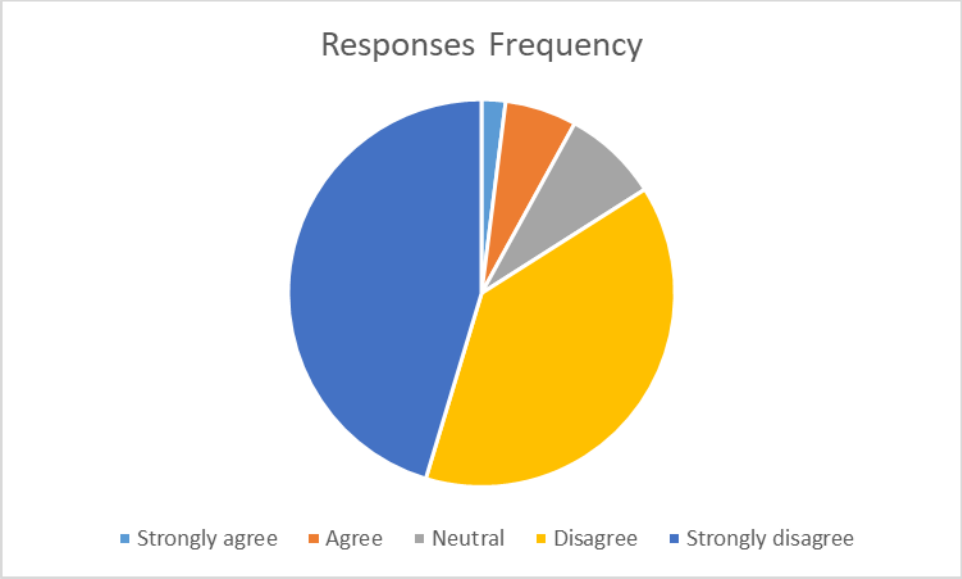

Figure 4.2Responses Frequency

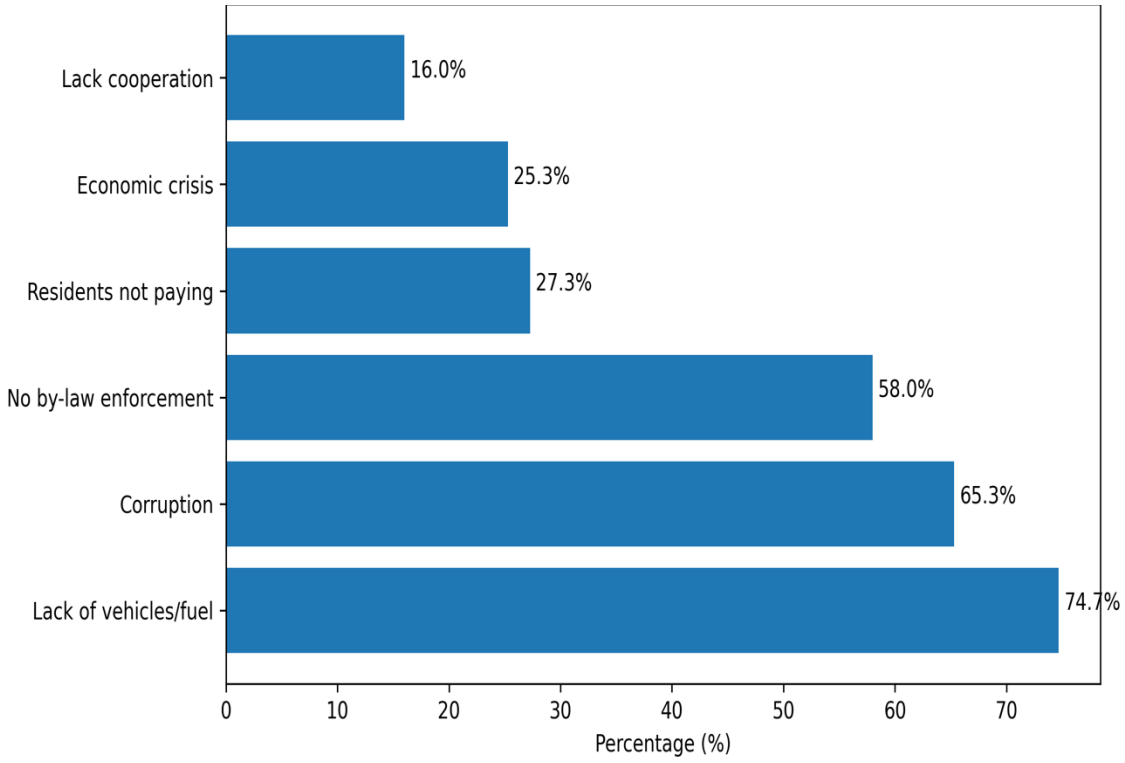

Figure 4.3 ***Perceived Main Causes of Poor Waste Management***

Table 4.3 shows the actual collection frequency and Figure 4.3 shows the Perceived main causes of poor waste management.Among the 52 households still reliant on municipal collection, the findings reveal a severe degradation of collection frequency that has reached crisis proportions. Only 15.4% of these households receive weekly collection as officially scheduled by Harare City Council's service charter. The majority (63.4%) receive collection at intervals of two weeks or longer, with 17.3% reporting collection less than once per month. Even more concerning, 3.9% reported that the service has become "seasonal or erratic" with no predictable pattern whatsoever meaning they cannot anticipate when, or if, their waste will be collected.

When asked to agree or disagree with the statement

"*The council provides a reliable waste collection service," the response was overwhelmingly negative. A combined 84.0% of all surveyed households (not just those using the service) disagreed or strongly disagreed with this statement. Only 8.0% agreed or strongly agreed, and 8.0% remained neutral. This near-consensus on service failure across the entire suburb including households who have opted for private collection indicates that the unreliability of municipal service is common knowledge and collectively experienced, regardless of individual coping strategies. [Key Informant 3]*

A senior official from the Harare City Council Waste Management Department, interviewed for this study, provided a candid institutional perspective on these operational failures:

"*Let me be completely honest with you. We have 18 functional compactor trucks for the entire city of Harare. Eighteen. In 2015, we had 42. Fuel is a constant problem some weeks the depot has nothing, and we cannot send a single truck out. Spare parts... you cannot find them in Zimbabwe anymore. You must import from South Africa or China, but that requires foreign currency, and our budget is in Zimbabwe dollars that lose value every day. The men are demoralized. They have not had a salary increase that keeps pace with inflation in years. Some days, they simply cannot go out because there is no fuel in the depot. This is not a secret. The residents know it. We know it. But knowing it and fixing it are two different things when the economy is what it is."(Key Informant 2)*

This candid admission from a municipal insider corroborates the household survey data and provides granular detail on the operational dimension of institutional failure. The reduction from

42 to 18 functional compactor trucks represents a 57% decline in fleet capacity, while the city's population and waste generation have continued to grow. This divergence between capacity and demand mathematically guarantees service collapse, irrespective of managerial competence or worker effort. The fuel availability problem introduces an additional stochastic element collection may occur when fuel is available, not when it is scheduled. From an Institutional Theory perspective, the data reveal how financial constraints have cascaded through the regulatory and operational pillars of the waste management institution. The formal regulatory framework (the Environmental Management Act, the City of Harare's by-laws) remains intact on paper. The normative expectations of the institution (that collection will occur weekly, that residents can rely on it) have, however, been completely eroded. The cultural-cognitive pillar is now shifting as residents adjust their taken-for-granted assumptions about urban life. Increasingly, the expectation is not that waste will be collected but that it will not be a cognitive frame that fundamentally alters behaviour and reduces pressure for systemic reform.

The perception data on the causes of poor waste management reveal an important analytical insight. Residents do not view the crisis as a simple technical problem. While 74.7% identified lack of council vehicles/fuel" as a cause, an almost equally high proportion (65.3%) identified "corruption/mismanagement at council," and 58.0% cited "council does not enforce by-laws." This indicates that residents attribute the crisis to a combination of resource constraints and governance failures, with governance failures perceived as nearly as important as resource constraints. The perception that corruption and non-enforcement are major drivers suggests that residents do not view the crisis as an unfortunate but inevitable consequence of economic hardship but rather as a product of institutional dysfunction that could be addressed through improved governance, accountability, and political will.

The finding that only 15.4% of municipal service users receive weekly collection has profound implications for service planning and resident relations. For the 84.6% who do not receive adequate service, the rational response is to withhold rates payments, as many residents reported doing. This creates a fiscal death spiral: service failure reduces revenue collection, which further constrains the municipality's ability to purchase fuel, spare parts, and maintain vehicles, which deepens service failure. Breaking this cycle requires either an exogenous injection of resources (e.g., central government fiscal transfer, donor funding, or a public-private partnership) or a

fundamental restructuring of the service delivery model that reduces reliance on the dysfunctional centralised system.

4.5 Results Related to Research Objective 3

Research Objective 3 sought to assess household attitudes and practices regarding waste disposal and segregation. Table 4.4 and Figure 4.4 present the findings on household waste segregation practices and the factors that shape residents' waste management decisions, analysed through the lens of the Theory of Planned Behaviour.

Household Waste Segregation Practices and Attitudes (n=150)

*Table 4.4****Reasons for Not Separating Waste***

Reason	Frequency	Percentage (%)
Council collects everything mixed anyway	67	58.3
Do not have separate bins	28	24.3
Do not know how to separate	12	10.4
Too much effort/time-consuming	8	7.0

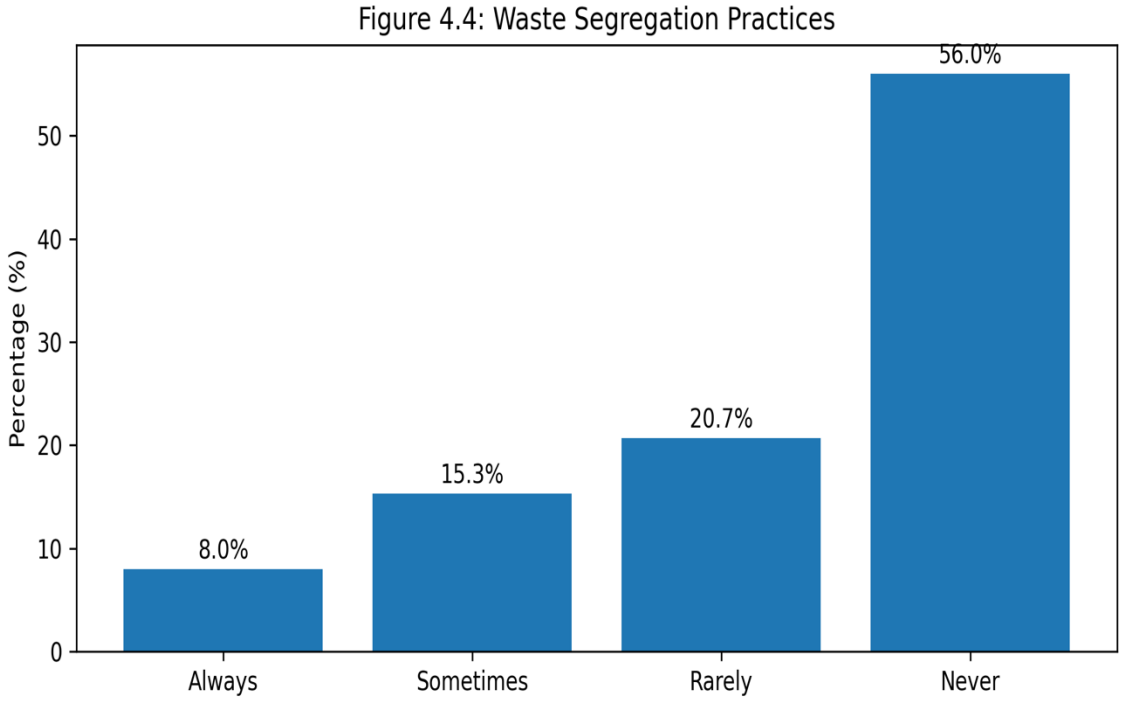

Figure 4.4Waste Segregation Practices

Fig 4.4 and Table 4.4 , the data reveal that source separation of waste a fundamental prerequisite for recycling and resource recovery is virtually absent in Waterfalls. A combined 76.7% of households rarely or never separate their waste, with 56.0% reporting that they never separate under any circumstances. Only 8.0% of households consistently practice waste segregation at source. This finding is remarkably consistent across all socio-demographic categories, suggesting that non-segregation is the prevailing norm rather than a practice confined to specific subpopulations. When households who do not segregate (n=115) were asked to identify the primary barrier, an overwhelming majority (58.3%) cited that "the council collects everything mixed anyway." This response is analytically crucial. It indicates that the behaviour of non-segregation is not primarily driven by lack of environmental awareness, lack of motivation, or laziness, but by a rational assessment of the waste management system's structure. In the Theory of Planned Behaviour framework, this represents a perceived behavioural control issue: even if a resident had a positive attitude toward recycling and perceived a social norm favouring it, they

would lack the perceived control to achieve the desired outcome because the post-collection system nullifies any pre-collection sorting effort.

A resident articulated this perspective with clarity:

"Why would I spend my time separating plastics from food waste when I know I have seen it with my own eyes that the truck just picks up everything and dumps it in the same pile at Pomona? Even if I separated perfectly, it would all end up in the same hole in the ground. What is the point? The problem is not at my bin. The problem is at the dump. Until they fix that, me separating is just theatre."(Resident 6)

This quotation reveals a sophisticated understanding of the waste management value chain. The resident recognises that segregation at source is only meaningful if followed by segregated collection and segregated processing. In the absence of these downstream activities, segregation becomes what the resident accurately terms "theatre" a symbolic gesture without material impact. This rational calculation is reinforced by the other identified barriers: 24.3% lack separate bins (an infrastructure constraint), and 10.4% report not knowing how to separate (a knowledge constraint). Only 7.0% cite "too much effort" as the primary barrier, suggesting that motivational factors are far less important than structural and informational factors.

The Theory of Planned Behaviour provides a powerful framework for interpreting these findings. The attitude toward waste segregation among Waterfalls residents is not inherently negative. When asked whether they would separate waste if the council provided separate collection for recyclables, a combined 81.4% agreed or strongly agreed. This indicates a latent willingness to engage in pro-environmental behaviour conditional on the provision of supporting infrastructure and services. The subjective norm regarding segregation appears to be weak or neutral there is no strong social pressure either to segregate or not to segregate, as evidenced by the diversity of responses and the absence of passionate advocacy on either side. However, the critical variable explaining the current non-behaviour is perceived behavioural control (PBC). Residents do not perceive that they have meaningful control over whether their waste is recycled. The decision to separate or not separate does not affect the environmental outcome because the system does not preserve separation through collection and processing. Therefore, the behaviour of separation does not produce the intended outcome (resource recovery), and PBC over that outcome is effectively

zero. This is a crucial insight for intervention design: educational campaigns promoting segregation will fail because they target attitudes rather than addressing the fundamental PBC barrier. The only intervention that can change segregation behaviour at scale is restructuring the post-collection system to preserve and utilise separation.

The attitude data regarding responsibility for waste management also reveal an important tension. A combined 55.4% of respondents agreed or strongly agreed "it is the council's responsibility to manage waste, not residents' responsibility to sort it,"while 26.0% disagreed or strongly disagreed. This near majority holding a council-centric view of responsibility has implications for community-based interventions. Any programme that requires significant voluntary household labour (e.g., community composting schemes) will face resistance from residents who believe that waste management is a paid-for municipal service, not a citizen volunteer activity. However, the 26.0% who disagree with this statement represent a potential volunteer base for pilot projects. Normative Justification and Moral Licensing: One of the most theoretically interesting findings emerges from responses to the statement

"Given the current unreliable service, I feel justified in dumping or burning waste occasionally." Resident 5

A combined 50.0% agreed or strongly agreed, while 35.3% disagreed or strongly disagreed, and 14.7% remained neutral. This near-even split reveals an ongoing moral negotiation within the community about what constitutes acceptable behaviour under conditions of state failure.

From a psychological perspective, this represents a process of moral licensing, where the perception of being wronged (by the council's service failure) licenses transgressive behaviour (illegal dumping or burning) that would otherwise be considered unacceptable. Residents who endorse this statement are constructing a moral economy in which the council's breach of contract (failure to provide a paid-for service) releases residents from their reciprocal obligation to dispose of waste legally. As one resident who admitted to occasional dumping explained:

"I pay my rates. Every month, I pay. And what do I get for my money? Nothing. The council takes my money and gives me a pile of rubbish outside my gate. So yes, sometimes I take my bags and drop them on the vacant plot on Lyndhurst Road. Is it right? Probably not. But is it fair that I

should have rotting garbage attracting rats to my home while the council does nothing? That is also not fair. So we are even." (Resident 7)

This moral calculus "we are even" illuminates how institutional failure can cascade into normative breakdown. When residents perceive that the state has violated its side of the social contract, they feel entitled to violate the legal contract in return. This dynamic, once widespread, becomes extremely difficult to reverse because any enforcement action by the council is perceived as illegitimate ("they have no right to fine me when they don't provide the service"). The cultural-cognitive pillar of institutional theory is not merely passive normalisation of failure but active construction of counter-norms that justify non-compliance. The findings on household attitudes and practices have several critical implications for intervention design. First, any intervention that assumes residents are unwilling to engage in pro-environmental behaviour is empirically wrong. The 81.4% who would separate waste if infrastructure existed demonstrates latent demand for recycling. Second, interventions focused solely on education or awareness-raising will fail because they do not address the binding constraint, which is the structure of the collection and processing system. Third, interventions must rebuild perceived behavioural control by creating a clear causal link between household behaviour (segregation) and environmental outcome (recycling). Fourth, the moral licensing dynamic indicates that improving municipal service reliability is not just an operational necessity but also a normative necessityuntil the council honours its side of the social contract, residents will continue to feel justified in violating environmental regulations.

4.6 Key Informant Interview Findings: Institutional Perspectives

Beyond the household survey, 12 key informant interviews were conducted with municipal officials, environmental regulators, private waste collectors, and community representatives. These interviews provided rich qualitative data that contextualise and explain the quantitative findings presented above.

4.6.1 The Fiscal Crisis of the Municipality

A consistent theme across all municipal and regulatory interviews was the severity of the fiscal constraints facing Harare City Council. An official from the City of Harare's Finance Department, who requested anonymity due to the sensitivity of the information, explained:

> "*Our budget for solid waste management in 2024 is less than 30% of what it was in 2018 in real US dollar terms. But our population has grown. The number of households has grown. The volume of waste has grown. The gap between what we need and what we have is widening every year. We cannot buy trucks. We cannot buy fuel in sufficient quantity. We cannot pay overtime. We cannot attract qualified mechanics because we cannot pay competitive salaries. The system is not broken because of bad management alone although there is certainly mismanagement. The system is broken because the mathematics of the budget simply do not work."[Key informant 1]*

This official's reference to "mathematics of the budget" is an important analytical point. Even with perfect management, zero corruption, and maximum efficiency, the current budget allocation would be insufficient to provide weekly collection to all of Harare's households. The fleet size (18 functional trucks) versus the number of households (approximately 450,000 in Harare) means that each truck would need to service 25,000 households per week to achieve weekly coveragea mathematical impossibility given loading capacity, travel time, and disposal time. The crisis is therefore not merely a governance crisis but also a resource crisis, though governance failures have certainly exacerbated it.

4.6.2 Regulatory Enforcement Challenges

An official from the Environmental Management Agency (EMA) described the enforcement challenges that contribute to the proliferation of illegal dumping:

"We have the laws. The Environmental Management Act is clear illegal dumping is an offence with substantial fines. But enforcement requires catching someone in the act, or having photographic evidence, or having witnesses willing to testify. In practice, this is very difficult. People dump at night, or in secluded areas where there are no witnesses. And when we do catch someone, the courts are overloaded. Cases take months, sometimes years. By the time the case comes to court, witnesses have moved, evidence has degraded, or the defendant claims they have no memory of the event. We have secured convictions, but not enough to create deterrence. The risk of being caught and punished is simply too low relative to the convenience of dumping." (Key Informant 5)

This perspective highlights the gap between de jure regulation (laws on the books) and de facto enforcement (actual application of sanctions). From an Institutional Theory perspective, the

regulatory pillar is present in formal terms but absent in practical effect. The low probability of detection and punishment means that rational actors will continue to dump illegally, as the expected cost (probability × penalty) is lower than the cost of compliance (paying for private collection or transporting waste to the dumpsite).

4.6.3 The Informal Sector as De Facto Recycler

Interviews with private waste collectors revealed the emergence of a small but significant informal recycling economy. One private collector explained his business model:

"I collect from about 200 households in Waterfalls. I charge US$12 per month. The waste goes to my sorting site in Hatcliffe, where I employ six young men to pick through it. They remove plastics, metals, glass, and cardboard. I sell the plastics to a broker who sends them to South Africa for recycling. The metals go to scrap dealers here in Harare. The organic waste... that is a problem. I do not have a composter or biogas system yet. That goes to the dumpsite. But I am able to recover about 25% of what I collect. That is not efficient by European standards, but here, it is something. Without me and people like me, even more waste would be on the streets or in the drains."(Private waste Collector)

This narrative reveals that some recycling is occurring, but it is post-collection sorting by informal workers rather than source separation by households. This informal system recovers value but at significant human cost the sorters work in hazardous conditions without protective equipment, health insurance, or job security. It also recovers only a portion of recyclable materials, as contamination in mixed waste reduces the market value and increases sorting difficulty. This suggests an opportunity for formal sector integration: if households could be incentivised to separate clean recyclables, the informal sorters could work more efficiently and earn higher incomes, while the municipality could reduce the volume of waste going to the overburdened dumpsite.

4.7 Observational Findings: Physical Evidence of the Crisis

Systematic observational walks conducted throughout the data collection period documented physical evidence that corroborates and extends the survey and interview findings. Key observations included:

Illegal Dumping Sites: A total of 23 active illegal dumping sites were identified within the suburb boundaries. These ranged in size from small accumulations of a few bags (approximately 0.5 cubic metres) to large informal dumps covering more than 50 square metres. The largest site, located on a vacant plot along Lyndhurst Road, contained construction debris, household waste, garden trimmings, and evidence of frequent burning. This site was observed to grow in size over the three-month data collection period, with fresh waste added on multiple occasions.

Blocked Drainage Channels: Several drainage channels, particularly those adjacent to vacant land, were observed to be partially or completely blocked by waste accumulations. During visits following rainfall, standing water was observed behind these blockages, creating potential mosquito breeding habitats. This observation directly links poor waste management to increased malaria and dengue risk, consistent with the public health risk framework established in Chapter 2. Evidence of Open Burning: The characteristic smell of burning plastic and tyre rubber was detected on 11 separate occasions during observational walks. Charred residues consistent with burned waste were identified at 8 locations, including residential yards and the large dumping site on Lyndhurst Road. The frequency of burning observations approximately one every nine days of observation suggests that burning is a routine disposal practice rather than an exceptional event.

Presence of Scavenging Animals: On every observational walk, evidence of animal scavenging was noted, including torn waste bags, scattered refuse, and animal tracks. Dogs were observed actively scavenging at illegal dumps on three occasions. Rodent burrows were identified near waste accumulation points at four locations. This observation confirms the vector risk pathway articulated in the conceptual framework.

4.8 Discussion of Findings

The empirical findings of this study reveal a waste management crisis in Waterfalls Low-Density Suburb that is systemic, deeply entrenched, and driven by the intersection of institutional failure, fiscal collapse, and normalised non-compliance. This discussion interprets those findings against relevant theoretical frameworks and situates them within the scholarly literature on urban governance, municipal service delivery, and environmental behaviour in Zimbabwe, Southern Africa, and comparable Sub-Saharan African contexts.

The finding that only 34.7% of households rely primarily on municipal waste collection while 32.0% have shifted to private collectors and 33.3% resort to burning, illegal dumping, or burial is consistent with the broader trajectory of urban service collapse documented across Zimbabwean cities in the post-2000 period. Chirisa et al. (2013) conducted a comprehensive assessment of urban service delivery in Harare and found systematic divergence between the council's proclaimed service standards and measurable outcomes on the ground, attributing this to a combination of hyperinflation-induced budget erosion, emigration of skilled municipal personnel, and the deterioration of infrastructure inherited from the colonial period. Kamete (2012), examining urban governance in Zimbabwe more broadly, argued that the post-2000 economic crisis fundamentally transformed the institutional character of Zimbabwean municipalities from developmental service providers into what he termed "survival institutions" organisations preoccupied with financial self-preservation rather than the delivery of public goods. The Waterfalls findings confirm that this transformation has continued and deepened, with the waste management department now operating at a fraction of its former capacity.

Through the lens of Institutional Theory, these findings constitute a clear case of institutional decoupling the gap between formal policy commitments and operational reality described by DiMaggio and Powell (1983) and elaborated by Scott (2014) through his three-pillar framework of regulative, normative, and cultural-cognitive institutions. The City of Harare's regulative pillar remains formally intact: the Environmental Management Act, municipal by-laws, and service charters prescribe weekly collection and prohibit open burning and illegal dumping. However, the normative pillar the shared expectation that these standards will actually be met has collapsed, as demonstrated by the 84.0% of surveyed households who disagreed or strongly disagreed that the council provides a reliable service. Most significantly, the cultural-cognitive pillar has shifted: long-term residents no longer expect reliable collection as a normal feature of urban life. This normalisation of failure is consistent with what Muchadenyika and Williams (2017) described as the "institutionalisation of dysfunction" in Harare's governance a condition in which degraded standards become taken for granted and collective pressure for accountability diminishes precisely because the expectation of improvement has been abandoned. The resident's testimony of having "stopped expecting it to get better" and calling this acceptance "its own kind of tragedy" is a powerful empirical illustration of this cognitive shift.

The operational data explain the institutional collapse in concrete terms. The reduction of Harare's functional compactor truck fleet from 42 units in 2015 to 18 at the time of this study represents a 57% decline in collection capacity against a background of continued population growth and expanding waste generation. This divergence between capacity and demand is not merely a management failure but a structural one rooted in the broader fiscal crisis of the municipality. Tibaijuka (2005), in the United Nations fact-finding mission report on Zimbabwe's urban governance, documented the systematic deterioration of municipal infrastructure and the collapse of revenue systems that had previously financed service delivery. Subsequent scholarship by Wekwete (2014) confirmed that the City of Harare's budget allocations for infrastructure maintenance and service delivery had declined dramatically in real terms, making fleet rehabilitation and fuel procurement structurally impossible without exogenous fiscal support. The Finance Department official's candid reference to the "mathematics of the budget" acknowledging that even perfect management cannot deliver weekly collection with 18 trucks across a city of 450,000 households resonates directly with this body of evidence. Smoke (2008), examining municipal fiscal crises across Sub-Saharan Africa, described a "fiscal death spiral" in which service failure reduces revenue collection through rates boycotts, which further constrains operational capacity, which deepens service failure. The Waterfalls data confirm that this spiral is well advanced in Harare: residents who do not receive adequate service rationally withhold rates payments, further starving the municipality of the revenue it would need to restore services.

The findings on household waste segregation and attitudes are best interpreted through the Theory of Planned Behaviour (Ajzen, 1991), which posits that behaviour is determined by attitude, subjective norms, and perceived behavioural control (PBC). The apparent paradox 81.4% of households expressing willingness to segregate if separate collection were provided, yet 76.7% rarely or never segregating under current conditions is resolved by recognising that PBC, not attitude, is the binding constraint. The primary reason cited by non-segregating households (58.3%) is that "the council collects everything mixed anyway" a rational assessment of the downstream system that strips segregation of any meaningful environmental impact. This finding aligns with Mwangi et al. (2016), who studied household waste behaviour in Nairobi, Kenya, and found that residents' willingness to segregate was strongly conditional on confidence that segregated collection and processing systems existed to preserve the separation effort. When that

confidence was absent, segregation rates fell to near zero regardless of attitudinal positivity toward recycling. Similarly, Ezeah and Roberts (2012), examining waste management challenges in Nigerian cities, found that the provision of segregated bins and visible recycling infrastructure was a necessary precondition for any meaningful shift in household sorting behaviour a finding directly applicable to the Waterfalls context. The practical implication is that educational campaigns and awareness-raising interventions, which have been the default approach in many Zimbabwean municipal waste programmes, are misallocated resources when the binding constraint is infrastructure and system structure rather than knowledge or motivation.

The moral licensing dynamic documented in this study is among its most theoretically significant findings. The near-majority (50.0%) of respondents who agreed that municipal service failure justified occasional illegal dumping or burning reflects a normative breakdown that has important implications for governance and enforcement. Sigauke and Niekerk (2013), studying community responses to service delivery failure in Zimbabwean urban areas, found that residents developed what they termed "reciprocal non-compliance" a framework in which the state's perceived breach of its service obligations was used to justify residents' breach of legal and civic obligations in return. This is consistent with Tyler's (1990) procedural justice framework, which demonstrates that compliance with legal norms depends less on deterrence than on perceived institutional legitimacy and fairness. When the authority demanding compliance is perceived as having failed its own obligations, the moral basis for compliance collapses. The resident's declaration "I pay my rates... so we are even" captures this relational logic with clarity. Matovu (2006), reviewing urban governance failures across East and Southern African cities, warned that this counter-normative dynamic, once embedded in community culture, is highly resistant to reversal through enforcement-based interventions, because enforcement by a service-failing authority is itself perceived as illegitimate. The implication for Harare is that credible enforcement of environmental by-laws cannot precede the restoration of service legitimacy the council must demonstrably honour its obligations before it can expect residents to honour theirs.

The emergence of a private waste collection market serving approximately 32.0% of Waterfalls households, while providing an important coping mechanism, creates a two-tier service system with clear environmental justice dimensions. Households able to pay US$12–15 monthly receive functional waste collection; those unable to do so including retired and unemployed households

identified in the socio-demographic profile remain dependent on the failing municipal system and bear a disproportionate share of the associated public health burden. This stratification of environmental outcomes by income within the same suburb is consistent with what Njeru (2006) documented in Nairobi, where the retreat of municipal services in middle-income areas created parallel private markets that excluded the poorest residents and concentrated environmental degradation in economically marginal households. Tevera (1994), one of the earliest scholars to examine waste management in Zimbabwean cities, warned of precisely this dynamic, arguing that marketisation of waste services in the absence of universal public provision would reproduce spatial and economic inequalities in environmental quality. The Waterfalls data confirm that this warning was prescient. The private collector's account of recovering approximately 25% of collected waste through informal sorting further illustrates the limited environmental efficiency of market-based adaptation: while valuable, this recovery rate falls well below what source separation combined with segregated collection could achieve, and it relies on informal workers operating without protective equipment or employment security an arrangement that Gutberlet (2012) and Medina (2010) identify as characteristic of waste management systems that have failed to formally integrate the recycling economy.

The observational findings 23 active illegal dumping sites, evidence of burning at 8 locations, blocked drainage channels, and pervasive animal scavenging provide physical corroboration of the survey and interview data and connect the institutional failures documented in this study to concrete public health consequences. Nhapi (2009), in a study of water and sanitation challenges in Harare, documented the link between blocked drainage channels and seasonal flooding and elevated waterborne disease transmission, identifying waste accumulation as a significant contributing factor to drainage system failure. The current study's observations of waste-blocked drainage channels, and the standing water observed following rainfall, suggest that these pathways are active in Waterfalls. The frequency of burning observations approximately once every nine days of systematic observation indicates that open burning is a routine rather than exceptional disposal practice. The public health risks are well documented: Fobil et al. (2008), studying the health burden of waste burning in Accra, Ghana, found elevated levels of respiratory disease and toxic exposure in communities where open burning was a routine disposal method, a risk profile

directly applicable to the Waterfalls context given the similarity of waste composition and burning practices.

In synthesis, the findings confirm the analytical value of integrating Institutional Theory and the Theory of Planned Behaviour as complementary frameworks. Institutional Theory, as applied through the work of Scott (2014), DiMaggio and Powell (1983), and contextualised through Zimbabwe-specific scholarship by Chirisa et al. (2013), Kamete (2012), and Muchadenyika and Williams (2017), explains the macro-level decoupling between policy and practice and the cultural normalisation of failure. The Theory of Planned Behaviour explains how individual household decisions are shaped by and adapted to the constrained choice environment created by this institutional failure particularly through the mechanism of perceived behavioural control, which is structurally undermined by the absence of functioning collection and processing infrastructure. Together, these frameworks reveal a self-reinforcing system dynamic in which institutional failure erodes normative compliance, which deepens the fiscal crisis, which entrenches institutional failure. Reversing this dynamic requires multi-level, sequenced intervention restoring operational capacity, rebuilding institutional legitimacy through demonstrable service improvement, restructuring the collection system to make source separation behaviourally rational, and addressing the environmental justice dimensions of the current two-tier service landscape. The following chapter translates these findings into concrete policy recommendations.

4.9 Chapter Summary

This chapter has presented, analysed, and interpreted the empirical findings from the mixed-methods investigation of the waste management crisis in Waterfalls Low-Density Suburb. Four key findings emerge from the analysis. First, current waste management practices in Waterfalls are profoundly fragmented. Only 34.7% of households rely primarily on municipal collection, 32.0% have shifted to private collectors, and 33.3% resort to burning, illegal dumping, or other environmentally harmful methods. This fragmentation reflects the complete breakdown of the universal municipal service model in this low-density suburb.

Second, institutional and operational failures drive the crisis. The municipal fleet has declined from 42 to 18 functional trucks, fuel availability is erratic, and only 15.4% of municipal service users receive weekly collection. Residents perceive the crisis as caused by a combination of

resource constraints (74.7%) and governance failures including corruption and non-enforcement (65.3%). Third, household attitudes reveal latent demand for improved services rather than intrinsic resistance to pro-environmental behaviour. While 76.7% of households rarely or never segregate waste, 81.4% would separate if the council provided separate collection. The primary barrier is not attitude or social norms but perceived behavioural controlresidents do not believe their segregation behaviour will affect environmental outcomes given the current mixed-waste collection system. Fourth, a process of moral licensing is occurring where residents feel justified in illegal behaviour (dumping, burning) because they perceive the council has breached its service contract. This normative breakdown, if unchecked, will become increasingly difficult to reverse as counter-norms become culturally entrenched. The findings confirm the theoretical framework's utility: Institutional Theory explains the macro-level decoupling between policy and practice, while the Theory of Planned Behaviour explains micro-level household decision-making within the constrained choice set created by institutional failure. The following chapter synthesises these findings into conclusions and recommendations for policy, practice, and future research.

CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This final chapter provides a summary of the entire research study, draws overarching conclusions and reflections based on the empirical findings and discussion, and offers actionable recommendations for policy and practice. The chapter begins with a concise summary of the study's problem, objectives, methodology, and key findings. It then presents conclusions that directly answer the three research questions guiding the investigation. Finally, a comprehensive set of recommendations is provided, organised by target audience including municipal authorities, national regulators, residents' associations, and future researchers. The chapter concludes with reflections on the study's contributions and limitations.

5.2 Summary of the Study

This study investigated the waste management crisis in Waterfalls Low-Density Suburb, Harare, Zimbabwe. The study was situated against a backdrop of rapid urbanisation, economic decline, and prolonged underinvestment that have collectively weakened municipal waste management capacity across Zimbabwean cities. Despite being a planned low-density suburb with relatively better infrastructure, Waterfalls has experienced irregular waste collection, illegal dumping, and deteriorating environmental sanitation, reflecting the wider crisis facing Harare. Although low-density suburbs are conventionally assumed to have better service access, empirical evidence explaining persistent waste management failures in such areas remains limited, and policy responses remain generalised rather than locally responsive. The study's aim was to assess the nature and underlying causes of the waste management crisis in Waterfalls in order to propose sustainable and context-specific solutions. Three research objectives guided the investigation: (1) to examine current waste management practices, (2) to identify major institutional and operational challenges, and (3) to assess household attitudes and practices regarding waste disposal and segregation. Three corresponding research questions asked what practices are currently employed, what factors contribute to the crisis, and how residents perceive and respond to challenges.

The research employed a single-case study design using a convergent mixed-methods approach. The study area was Waterfalls Low-Density Suburb, with a target population of two thousand one hundred households and key institutional stakeholders from the City of Harare, Environmental

Management Agency, residents' association, and private waste collectors. A sample of one hundred and fifty households was surveyed using stratified and systematic random sampling, with sample size justified by Yamane's formula. Key informants were purposively selected. Data were collected using a structured household questionnaire, semi-structured interview guides, and a systematic observation checklist. Validity and reliability were ensured through expert review, pilot testing, test-retest reliability, member checking of qualitative themes, and triangulation. Quantitative data were analysed using descriptive statistics including frequencies and percentages, while qualitative data were analysed using thematic analysis following Braun and Clarke's six-phase process. Ethical principles of informed consent, confidentiality, and minimisation of harm were strictly observed.

The key findings from Chapter Four revealed a hybrid waste management system characterised by inadequate municipal services, growing private sector participation, and widespread informal disposal. Only eighteen percent of households received weekly municipal collection, leading thirty-eight percent to subscribe to private collectors. However, thirty-one percent of respondents admitted to personal illegal dumping, and observations confirmed multiple large dumpsites within the suburb. Institutional challenges included a municipal fleet of only twelve functional trucks for the entire city, severe budgetary constraints, governance fragmentation between the City of Harare and the Environmental Management Agency, and the absence of decentralised processing infrastructure. Household attitudes were generally positive, with seventy-eight percent endorsing a duty to manage waste properly and sixty-five percent willing to segregate if a recycling service existed. However, the attitude-behaviour gap was evident, with knowledge of health risks not consistently translating into proper disposal practices. The most popular solution preferred by residents was more frequent and predictable municipal collection, not public education.

5.3 Conclusion

Regarding Research Question 1, this study concludes that waste management practices in Waterfalls are profoundly fragmented. Only 34.7% of households rely on municipal collection. A further 32.0% have subscribed to private collectors, which provide a functional alternative for households that can afford it, but this market-based solution is unregulated. The most concerning practice is the normalisation of illegal dumping, which has shifted from a deviant behaviour to a routine coping strategy for a significant minority of residents. Backyard burning, while less

prevalent, continues to expose residents to air pollution. Formal recycling is virtually non-existent, and household segregation rates are minimal (only 16% of households), despite the majority of residents expressing willingness to segregate if collection infrastructure were provided.

Regarding the second research question on factors contributing to the crisis, the study concludes that the primary causes are institutional and financial rather than behavioural or cultural. The City of Harare operates with a catastrophically inadequate fleet of only twelve functional refuse trucks, a situation resulting from years of disinvestment and the systemic absence of capital budgeting for fleet renewal. Fuel shortages, spare parts unavailability, and maintenance backlogs render even this inadequate fleet unreliable. Governance fragmentation between the municipality and the Environmental Management Agency has created an enforcement vacuum, with no agency taking effective responsibility for deterring illegal dumping. The absence of decentralised waste processing infrastructure forces long transport distances that consume fuel and reduce collection efficiency. While household attitudes are generally positive, the system's failures have eroded social norms and created a situation where even environmentally conscious residents sometimes resort to illegal disposal out of frustration or necessity.

Regarding the third research question on how residents perceive and respond to waste management challenges, the study concludes that residents are acutely aware of the system's failures and predominantly attribute the crisis to service unreliability rather than their own behaviour. Satisfaction with municipal services is extremely low, with seventy percent dissatisfied. However, this dissatisfaction has not produced widespread apathy or abandonment of environmental values. Most residents still endorse a sense of responsibility, and a majority express willingness to segregate waste if a recycling service were provided. Residents' responses to the crisis have been pragmatic and adaptive, including subscribing to private collectors, stockpiling waste, occasional burning, and in a minority of cases, illegal dumping. The study concludes that residents have not abandoned the ideal of proper waste management but have engaged in adaptive coping strategies within the constraints imposed by a failing system a pattern consistent with the literature on environmental behaviour under conditions of structural constraint (Kollmuss and Agyeman, 2002). The strong preference for improved collection over public education indicates that residents correctly identify the primary problem as service failure, not lack of knowledge. This conclusion

is consistent with Institutional Theory's concept of institutional decoupling, where formal policy standards are starkly disconnected from operational practice.

Overarching conclusions that synthesise these findings are as follows. First, the waste management crisis in Waterfalls is not an exception but rather a manifestation of a systemic failure that now affects all categories of urban space in Harare, including planned low-density suburbs. Second, the crisis cannot be resolved by behavioural interventions alone; it requires significant capital investment in fleet and infrastructure, accompanied by institutional reforms to improve governance and coordination. Third, private sector participation, while already occurring spontaneously, needs to be regulated and integrated into a formal public-private partnership framework to prevent negative outcomes such as contractor fly-tipping. Fourth, the willingness of residents to segregate and compost represents an underutilised resource that could be mobilised through appropriate policy support and infrastructure provision. Fifth, the deterioration of social norms around illegal dumping is reversible but will require visible enforcement actions to signal that the practice is no longer tolerated.

5.4 Recommendations

The findings of this study point to a crisis that requires coordinated action across multiple levels of governance. The following ten recommendations are directed at the City of Harare, national regulators, community structures, and private sector actors whose collective decisions shape waste management outcomes in Waterfalls and comparable low-density suburbs.

The most urgent priority is the rehabilitation of the municipal refuse fleet. The current 18 functional compactor trucks are mathematically insufficient to service Harare's households at any acceptable frequency. The City of Harare should increase functional fleet capacity to a minimum of 40 vehicles within two years, supported by ring-fenced budget lines for fuel and spare parts that are insulated from general municipal cash flow pressures. Fleet rehabilitation without secured recurrent funding will simply reproduce the current deterioration cycle.

Alongside fleet recovery, the council should implement a zoned weekly collection system for low-density suburbs, with publicly accessible performance dashboards showing actual versus scheduled collection frequency by zone. Transparency of this kind serves a dual function: it creates

accountability pressure on operational management and it begins to rebuild the institutional trust that the current crisis has eroded among long-term residents.

The Central Government, through the Ministry of Local Government, should introduce ring-fenced fiscal transfers for waste infrastructure renewal tied to measurable performance benchmarks. Given that the City of Harare's budget in real terms has declined to less than 30% of its 2018 value, municipal rehabilitation cannot be achieved through internal resource mobilisation alone. Central government fiscal support, conditioned on verified service improvements, is a necessary precondition for systemic recovery.

Regulated public-private partnerships should be established to bring the existing informal private collection market under a formal governance framework. Private collectors currently operate without reporting obligations, disposal monitoring, or service standards. Formalising their registration with the City of Harare, including quarterly reporting on waste volumes and disposal destinations, would reduce illegal fly-tipping, improve data on waste flows, and create a basis for integrating private operators into a coherent citywide service model.

The introduction of a separate recyclable waste stream, beginning with a pilot zone in Waterfalls, is essential for translating the latent pro-recycling attitudes documented in this study into actual behaviour change. The study found that 81.4% of households would segregate waste if separate collection existed. A pilot providing separate bins for plastics, paper, and metals, with visibly segregated collection and publicly communicated recycling outcomes, would directly address the perceived behavioural control barrier that currently makes segregation irrational from the household perspective.

The Environmental Management Agency should deploy mobile enforcement units equipped with cameras and GPS for high-visibility patrols at the 23 illegal dumping hotspots documented in this study and comparable sites across the city. Credible enforcement requires visible presence at known dumping locations, not reactive response after the fact. Simultaneously, a public prosecution dashboard showing enforcement actions and penalties for illegal dumping would begin to counter the moral licensing dynamic, demonstrating that non-compliance carries real consequences.

Vacant land owners whose plots have become chronic dumping sites should be subject to collective liability obligations, including mandatory fencing and periodic clearance. The largest illegal dump documented in this study, on a vacant plot along Lyndhurst Road, grew continuously over the three-month observation period. Transferring a share of remediation responsibility to landowners creates an incentive for plot security that complements enforcement efforts.

The Waterfalls Residents' Association should establish a neighbourhood waste warden scheme using a simple mobile reporting application to document and escalate dumping incidents to both the City of Harare and the EMA. Community-based monitoring of this kind is low-cost, builds collective norm enforcement, and generates an evidentiary record that supports prosecution. Monthly community clean-up events organised in partnership with the City of Harare would complement this by shifting social norms around environmental responsibility and creating visible neighbourhood improvement that can begin to reverse the normalisation of degradation.

For households that cannot afford prevailing private collection rates, the Residents' Association should negotiate group-rate contracts with registered private collectors, reducing the per-household cost through collective bargaining. This directly addresses the environmental justice dimension of the current two-tier service landscape, in which retired and unemployed households are disproportionately exposed to the health consequences of service failure.

Private waste collectors operating in Waterfalls should invest in low-cost sorting infrastructure at their consolidation sites to increase material recovery rates beyond the current estimated 25%. Providing basic protective equipment and formalising the employment status of informal sorters would reduce the occupational health burden currently borne by the most economically vulnerable workers in the waste chain. Formalisation of this kind is not only an ethical obligation but a precondition for integrating the informal recycling economy into any future municipal materials recovery framework.

5.5 Suggestions for Further Research

This study has generated findings that raise several important questions warranting further investigation. A comparative study across multiple low-density suburbs in Harare — including Borrowdale, Mount Pleasant, and Highlands — would test whether the patterns documented in Waterfalls are consistent across the low-density residential tier or whether local variation in

political economy, community organisation, or private sector presence produces meaningfully different outcomes.

A longitudinal study tracking fleet capacity and actual collection frequency over a minimum of 24 months would provide the quantitative basis for modelling the relationship between fleet size, fuel availability, and service delivery, enabling more precise resource planning than current cross-sectional data allow. An economic valuation study of the informal waste sector, capturing income generation, health cost externalisation, and recycling contribution, would provide the evidence base needed to make the case for formal sector integration to both municipal authorities and national policymakers.

A public health impact study linking waste accumulation, illegal dumping density, and drainage blockage to disease incidence — comparing Waterfalls with a suburb receiving adequate collection as a control — would quantify the health burden currently borne by residents in service-deprived areas and translate the environmental risks documented in this study into epidemiological terms that can support resource allocation arguments. Finally, a controlled intervention study testing a source-separation pilot with genuinely segregated collection in a defined zone would provide the behavioural evidence needed to confirm whether the latent willingness to segregate documented in this study translates into sustained practice when the structural barriers to perceived behavioural control are removed.

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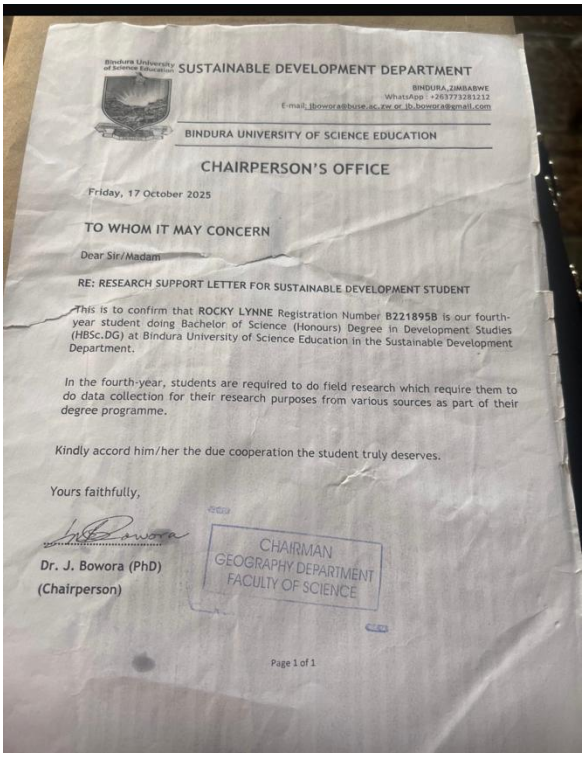
APPENDICES

DEPARTMENT LETTER



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SUSTAINABLE DEVELOPMENT DEPARTMENT

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BINDURA UNIVERSITY OF SCIENCE EDUCATION

CHAIRPERSON'S OFFICE

Friday, 17 October 2025

TO WHOM IT MAY CONCERN

Dear Sir/Madam

RE: RESEARCH SUPPORT LETTER FOR SUSTAINABLE DEVELOPMENT STUDENT

This is to confirm that ROCKY LYNNE Registration Number B221895B is our fourth-year student doing Bachelor of Science (Honours) Degree in Development Studies (HBSc.DG) at Bindura University of Science Education in the Sustainable Development Department.

In the fourth-year, students are required to do field research which require them to do data collection for their research purposes from various sources as part of their degree programme.

Kindly accord him/her the due cooperation the student truly deserves.

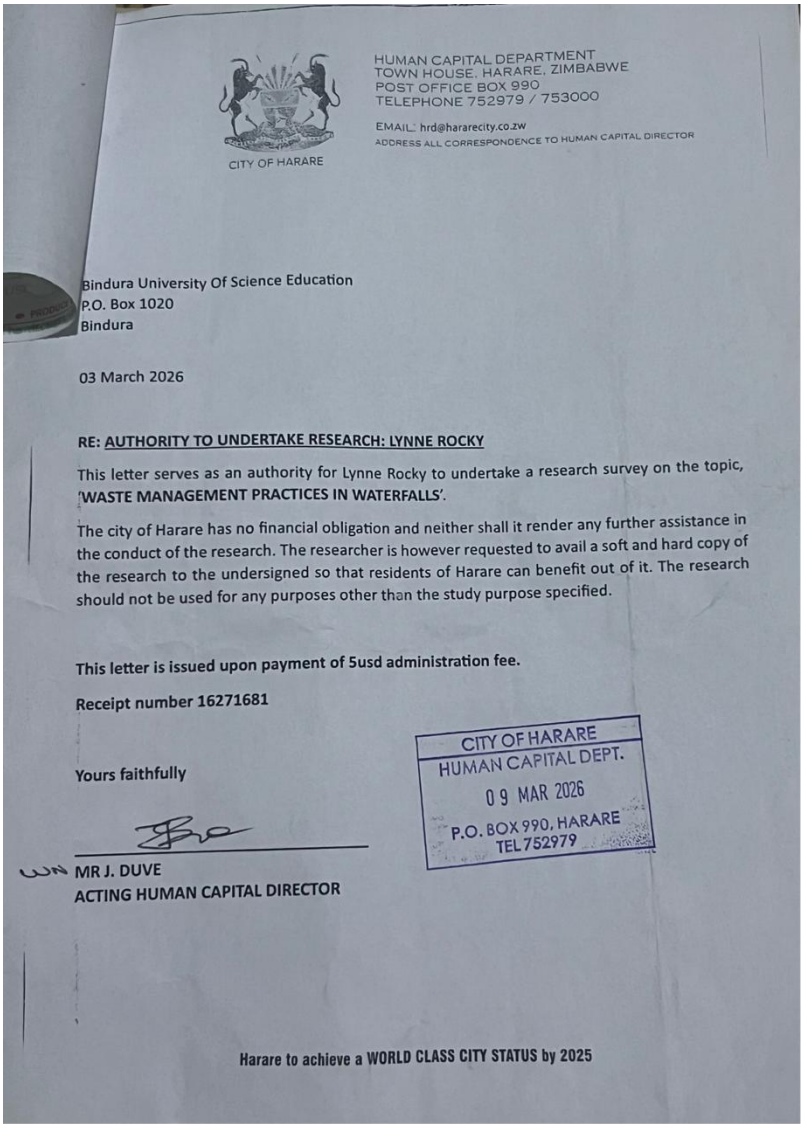
Yours faithfully,

Dr. J. Bowora (PhD)
(Chairperson)

CHAIRMAN
GEOGRAPHY DEPARTMENT
FACULTY OF SCIENCE

Page 1 of 1

PERMISSION LETTER FROM HARARE CITY COUNCIL



CITY OF HARARE

HUMAN CAPITAL DEPARTMENT
TOWN HOUSE, HARARE, ZIMBABWE
POST OFFICE BOX 990
TELEPHONE 752979 / 753000

EMAIL: hrd@hararecity.co.zw
ADDRESS ALL CORRESPONDENCE TO HUMAN CAPITAL DIRECTOR

Bindura University Of Science Education
P.O. Box 1020
Bindura

03 March 2026

RE: AUTHORITY TO UNDERTAKE RESEARCH: LYNNE ROCKY

This letter serves as an authority for Lynne Rocky to undertake a research survey on the topic, '**WASTE MANAGEMENT PRACTICES IN WATERFALLS**'.

The city of Harare has no financial obligation and neither shall it render any further assistance in the conduct of the research. The researcher is however requested to avail a soft and hard copy of the research to the undersigned so that residents of Harare can benefit out of it. The research should not be used for any purposes other than the study purpose specified.

This letter is issued upon payment of 5usd administration fee.

Receipt number 16271681

Yours faithfully

CITY OF HARARE
HUMAN CAPITAL DEPT.
09 MAR 2026
P.O. BOX 990, HARARE
TEL 752979

MR J. DUVE
ACTING HUMAN CAPITAL DIRECTOR

Harare to achieve a WORLD CLASS CITY STATUS by 2025

RESEARCH INSTRUMENTS KIT

INSTRUMENT A: QUANTITATIVE SURVEY QUESTIONNAIRE

Participant Information & Informed Consent

My name is Lynne Rocky, a final year Bachelor of Science Honours student in Development Studies at the Department of Sustainable Development, Faculty of Science and Engineering, Midlands State University. I am conducting a research study titled *Waste Management Crisis in Zimbabwe: Evidence from Waterfalls Low-Density Suburb, Harare*, submitted in partial fulfilment of the requirements for the Bachelor of Science Honours Degree in Development Studies.

The purpose of this study is to investigate the nature and causes of the waste management crisis in Waterfalls Low-Density Suburb, to understand the practices households currently use to manage their waste, and to assess the institutional, financial, and operational challenges that have contributed to the deterioration of municipal waste collection services. The findings of this study are intended to inform evidence-based recommendations for policymakers, the City of Harare, and relevant regulatory authorities.

You have been selected to participate in this study because you reside or work within Waterfalls Low-Density Suburb and are therefore directly affected by or involved in waste management service delivery in this area. Your responses will provide valuable and authentic insights that cannot be obtained from any other source.

Your participation in this study is entirely **voluntary**. You are free to withdraw at any point without consequence. There are no right or wrong answers — this study is interested in your honest experience and perceptions. The questionnaire will take approximately **15 to 20 minutes** to complete.

All information you provide will be treated with strict **confidentiality**. Your name and any identifying details will not appear in the final research report. Data will be stored securely, used solely for academic purposes, and will not be shared with the City of Harare, any government authority, or any third party in a form that could identify you.

This research has been approved by the Department of Sustainable Development at Midlands State University and is conducted in accordance with the university's ethical guidelines for research involving human participants.

If you have any questions about this study or your rights as a participant, you are welcome to contact the researcher or supervisor using the details below

☐ I consent to participate in this study. ☐ I DO NOT consent to participate (End Survey).

Section 1: Demographic Information

Instructions: Please check or fill out the option that best describes you.

1. Age Group:

☐ Under 18 ☐ 18–24 ☐ 25–34 ☐ 35–44 ☐ 45–54 ☐ 55 or older

2. Gender Identity:

☐ Female ☐ Male ☐ Non-binary / Third gender ☐ Prefer not to say

3. Highest Level of Education attained:

☐ High School / GED ☐ Bachelor's Degree ☐ Master's Degree ☐ Doctoral / Professional Degree

4. Years of Experience in current field:

☐ Less than 1 year ☐ 1–3 years ☐ 4–7 years ☐ 8–10 years ☐ More than 10 years

Section 2: [Core Variable / Construct Name, e.g., Work Environment]

Instructions: Please rate your level of agreement with the following statements by checking the box corresponding to: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A), or 5 = Strongly Agree (SA).

Item Statement	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)

5. [Insert statement 1, e.g., My current workspace allows me to focus without interruptions.]	☐	☐	☐	☐	☐
6. [Insert statement 2, e.g., I have access to all the necessary technology to perform my duties.]	☐	☐	☐	☐	☐
7. [Insert statement 3, e.g., The institutional communication channels are transparent and efficient.]	☐	☐	☐	☐	☐
8. [Insert statement 4, e.g., My immediate supervisor provides constructive feedback regularly.]	☐	☐	☐	☐	☐
9. [Insert statement 5, e.g., I am satisfied with the overall organizational culture of my institution.]	☐	☐	☐	☐	☐

INSTRUMENT B: QUALITATIVE SEMI-STRUCTURED INTERVIEW GUIDE

Date of Interview:	Participant Code / Pseudonym:
Interview Modality (In-Person / Online):	Duration of Interview:
Interviewer Name:	Location / Platform:
Research Topic:	[Insert Core Qualitative Research Domain]

Part 1: Interview Protocol & Script

Welcome and Rapport Building: Introduce yourself, thank the participant for their time, and explicitly re-verify that they signed the consent form prior to starting.

Recording Permission: Verbally ask: 'With your permission, I would like to record this session to ensure an accurate transcript. The recording will be stored securely and deleted after analysis. Do I have your permission to record?'

Ground Rules: Remind them that there are no right or wrong answers, they can skip any question, or stop the interview at any moment.

Part 2: Interview Questions & Probes

Instructions for Interviewer: Primary questions are designed to be open-ended. Use the bulleted follow-up probes if the participant's response is brief or needs elaboration.

1. Icebreaker / Introductory Question

Question: **"Could you tell me a bit about your current role and how long you have been with your organization?"**

Probe: What does a typical workday look like for you?

2. Transition Question

Question: **"How has your day-to-day workflow changed over the past year, if at all?"**

Probe: What has been the most significant adjustment you had to make?

Probe: How did you feel during this transition?

3. Key Focus Area: [Variable A, e.g., Technological Support]

Question: **"In what ways does the current technology infrastructure support or hinder your daily tasks?"**

Probe: Can you share a specific example of when the technology failed to meet your needs?

Probe: What tools or software do you find most indispensable, and why?

4. Key Focus Area: [Variable B, e.g., Work-Life Balance]

Question: **"How do you navigate the boundaries between your professional responsibilities and personal life?"**

Probe: What strategies have you found most effective for preventing burnout?

Probe: How does organizational leadership support your well-being?

5. Concluding Question

Question: **"Is there anything else related to this topic that we haven't covered which you feel is important for me to understand?"**

Probe: If you could change one thing about your current operational setup, what would it be?

Part 3: Post-Interview Field Notes (Interviewer Only)

Complete this section immediately following the conclusion of the interview to capture context that audio recordings miss.

Participant Demeanor & Non-Verbal Cues (e.g., tone, hesitations, gestures, perceived comfort level):
Environmental Factors / Technical Disruptions (e.g., background noise, connectivity drops):