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ASSESSING THE IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT ACCOUNTING FOR WASTE MANAGEMENT EFFICIENCY.A CASE OF HARARE CITY.

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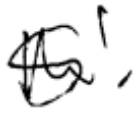

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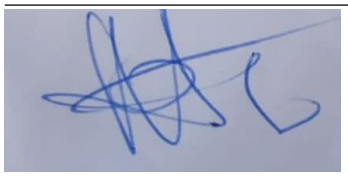

Chairperson

DEDICATION

To the Almighty God, for the gift of wisdom and strength.
To my parents, for their unwavering belief in my potential.
To the municipal workers of Harare, who navigate broken systems daily.

ABSTRACT

There is an obvious paradox in terms of municipal solid waste management in Harare with substantial budgetary allocations every year towards Cleansing Services going hand in hand with the worsening environmental performance. This qualitative case study examined the application of Environmental Management Accounting (EMA) as a possible means to enhance the efficiency of waste management at Harare City Council (HCC). The institutional theory and specifically the notion of organisational decoupling and the recently emerging literature on Material Flow Cost Accounting (MFCA) in Southern African municipalities guided the research. A total of twelve key informants were purposively selected from the Accounting Department and the Waste Disposal Department. The data was gathered through semi-structured interviews held during the period May 4th–22nd, 2026, and analysed through reflexive thematic analysis using ATLAS.ti 25 qualitative data analysis software. The results indicate a clear disconnection of physical waste information from monetary accounting information. The Waste Department uses estimated weight information based on manual counting and weighing at a dysfunctional weighbridge.The Accounting Department operates a conventional cashbasis system in which environmental costs, including litigation settlements and landfill liabilities, are absorbed into generic overhead pools, rendering the true cost of waste mismanagement invisible to decision-makers. Four interconnected themes emerged from the analysis: a physical data void characterised by systematic estimation rather than measurement; monetary cost hiding through undifferentiated overhead accounting; a normative capacity gap in which professional accounting education has not equipped municipal accountants with EMA competencies; and a political economy of opacity in which the absence of performance metrics serves defensive institutional interests. The study contributes to the nascent body of post-2020 critical accounting research in Zimbabwean local government and offers a transferable diagnostic framework for analysing EMA readiness in financially distressed municipalities. Keywords:Environmental Management Accounting, Material Flow Cost Accounting, Institutional Decoupling, Solid Waste Management, Harare City Council, Qualitative Research, ATLAS.ti 25.

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Chapter 1

INTRODUCTION

1.1 Background to the Study

Solid waste management in the Global South has become one of the key governance problems of the twenty-first century. There is rapid urbanization and changing consumer behavior in conjunction with a restricted budget for African cities, resulting in the increase in the generation of waste without improving the provision of collection and disposal facilities (Godfrey et al., 2020). Looking at Harare, an illustration of this problem, used to be called the "Sunshine City" of Southern Africa but is now experiencing long-term failure of its solid waste management system. Waste is accumulating in the Central Business District, in suburbs like Mbare, Highfield, Kuwadzana, and Dzivarasekwa, as well as in rivers and streams, leading to a three-tiered problem of public health, environment, and urban aesthetics (Mapfumo et al., 2023).

While the above problem is overtly visible, there is an underlying problem that is invisible yet very critical and this is the crisis of accounting information. The Harare City Council provides vast amounts of money for the Cleansing Services Vote each year for refuse compactor trucks, fuel, maintenance, and labor. However, the link between the inputs in terms of money and output in terms of tonnes of waste collected, transported, and disposed of is not accounted for.

Environmental Management Accounting can be defined, according to Schaltegger & Burritt (2021), as the integration of two types of data for internal decision making within an organisation – physical information about the flows of materials, water, and energy, and monetary information about costs, profits, and savings related to the environment. Contrary to traditional financial accounting, which focuses on providing information to outsiders and classifying costs, EMA is an internal management instrument meant to uncover the real costs associated with waste and inefficient resource use. Its main techniques include Material Flow Cost Accounting (MFCA), based on ISO 14051:2011. MFCA tracks materials through an organisational process and measures both the useful outputs and losses of materials (waste) in physical and monetary units (International Organization for Standardization, 2011).

The theoretical case for EMA in municipal waste management is compelling. By calculating the cost-per-tne of waste generated, the cost of recyclables that end up at the landfill site, and the contingent costs of environmental contamination, the local authority is able to make decisions on resource allocation, tariffs, and investments in waste diversion infrastructure (Gunarathne & Lee, 2021). EMA turns what had been seen as a cost into a clear cost object. However, the practical experience of implementing EMA in African municipalities has been markedly different from its theoretical potential. A series of critically oriented academic studies, elaborated upon in Chapter Two, have shown that the discrepancy between the adoption of EMA policies and their real-life application remains a consistent problem, conceptualized as organizational decoupling (Johnstone, 2020; Nyamwanza et al., 2023; Mbelwa & Nyamwanza, 2022).

There are certain features of the situation in Zimbabwe which make studying the implementation of EMA especially urgent and fascinating. Specifically, the urban councils in Zimbabwe are managed by the Urban Councils Act (Chapter 29:15) and they come under the jurisdiction of the Ministry of Local Government and Public Works. The Environmental Management Act (Chapter 20:27) introduces the Environmental Management Agency (EMA-Zimbabwe) and prescribes the measures of environmental protection, which include adequate waste management. Annual audits of municipal financial statements are performed by the Office of the Auditor General. In theory, this system should provide a strong coercion for environmental responsibility. However, according to Mapfumo et al. (2023), no provisions were made for environmental liabilities in the financial statements of five biggest urban councils in Zimbabwe.

Secondly, the macroeconomic environment in Zimbabwe, which is characterised by an unstable currency, hyper-inflation periods, and an extensive informal economy, creates a situation where short-term cash management is more common than the longterm, strategic approach that the implementation of EMA requires (Mafira & Zhou, 2020). The professional accounting environment also needs to be considered. The professional qualification examinations in Zimbabwe are regulated by the Institute of Chartered Accountants of Zimbabwe (ICAZ), and the PAAB oversees the profession. The absence of EMA and MFCA in these programmes means that the influence of professional bodies will not drive environmental accounting innovations.

The present study is positioned at the crossroads of the urban environmental crisis and the crisis of accounting information. It explores the issue of whether EMA is used in Harare City Council to manage waste and why the lack of EMA can be observed in the

context of waste management using a qualitative case study. The critical institutional approach to this phenomenon has been selected as it implies considering the lack of EMA not as a lack of capacity but rather as something that needs to be explained.

1.2 Statement of the Problem

Although the budget allocation by the Harare City Council to the Cleansing Services for waste management is significant, it is not possible to evaluate the effectiveness of such budget allocation because there is no Environmental Management Accounting System employed by the council. The waste management system uses an unscientific way of measuring the quantities of waste collected, disposed of, and recycled through manual counting and non-operational weighbridges. It is hard to assess the cost of waste management because the costs incurred are accounted for in the general overhead account. This is while in practice, there are two separate information streams, namely the physical and the monetary.

The result of the above informational gap is that management is unable to determine the cost per tonne of the waste collected, which is the simplest measure of efficiency. The financial value of the wasted waste, which is both service delivery cost and a lost opportunity for recyclable revenue, is unknown. There is no estimation of the contingent costs of the environmental damage, such as contamination of the groundwater from the Pomona dumpsite.

The situation is further complicated by the organizational setting within which the council finds itself. There is no requirement for environmental cost-efficiency ratios to be reported by the Auditor-General's Office. EMA and MFCA are not included in the syllabus of ICAZ. Harare City Council's enterprise resource planning system does not have environmental accounting modules. Furthermore, the political culture of reacting to crises encourages obvious but token actions such as clearing up a heap of rubbish to provide a photo opportunity for the mayor.

This study seeks to solve this problem through a qualitative analysis of the existing accounting and waste data procedures at Harare City Council in terms of where physical and monetary data streams depart from each other and the institutional reasons behind their divergence.

1.3 Research objectives

The purpose of this study is to critically assess the implementation of Environmental Management Accounting for solid waste management at Harare City Council. Specifically, the study aims:

1. To examine the methods and systems currently used by the Waste Disposal Department to track and record physical waste flows.

2. To analyse how the Accounting Department classifies, allocates, and reports the monetary costs associated with waste management operations.

3. To identify and analyse the institutional, technical, and professional barriers that prevent the integration of physical waste data and monetary cost data into a coherent EMA framework.

4. To develop recommendations, grounded in the empirical findings and the international EMA literature, for advancing EMA implementation in the Harare City Council context.

1.4 Research Questions

Consistent with the purpose of the study, the following research questions guided the investigation:

1. What physical waste tracking and recording systems are currently operational in the Waste Disposal Department, and what is the perceived reliability of the data these systems produce?

2. How does the Accounting Department classify, record, and report the monetary costs of waste management operations, and what environmental costs, if any, remain unallocated or unrecognised in the current chart of accounts?

3. What institutional, technical, professional, and political factors explain the current relationship, or lack thereof, between physical waste data and monetary accounting data at Harare City Council?

1.5 Significance of the Study

The significance of this research is derived from the intersection of the practical urban governance problem and the conceptual lacuna in the field of environmental accounting.

In practice, the study will help the management of the Harare City Council in making decisions on the areas where they need to invest in terms of information infrastructure development, development of chart of accounts and development of staff expertise.

At the professional level, the research will provide evidence to ICAZ and PAAB as far as the gap exists between the competencies that the professional accounting education produces and those competencies needed in environmental cost management in the public sector.

1.6 Assumptions

The research is based on the following assumptions, which are considered prerequisites for conducting the research:

- That the chosen respondents have enough knowledge about their departmental systems and processes to give relevant answers to the research questions.
- That participants answered the questions honestly, despite the politically sensitive nature of the topic.
- That the individual case study of the Harare City Council, even though it is not statistically generalizable, has the potential to produce analytical findings that can be generalized theoretically to other Zimbabwean urban councils experiencing financial distress and functioning in similar institutional environments.

1.7 Delimitations of the Study

Delimitations define the boundaries of the research study. The following boundaries were intentionally set by the researcher in order to ensure the study remained manageable and feasible:

- Geographical delimitation: The study is limited to the geographical jurisdiction of Harare City Council. Other Zimbabwean municipalities such as Bulawayo, Gweru, Mutare, and Chitungwiza are excluded from the research. The findings can have implications for these councils, but are not meant to represent them.

- Thematic delimitation: The study will be limited only to EMA applied to solid waste management. The use of EMA in water management, energy efficiency, wastewater treatment, or air pollution will not be considered.

- Departmental Delimitation: This study is delimited to the Accounting Department (Finance Directorate) and the Waste Disposal Department (Works Directorate). While other departments, such as the Health, Housing, and City Solicitor's Offices, are involved in some way with waste management activities, this study has no focus on them.
- Hierarchical Delimitation: Management and supervisory personnel were the only persons interviewed in this study. Laborers, garbage collectors, and community based waste pickers, although part of the larger picture, are out of the purview of this research, since the latter focuses on the accounting system itself.

- Temporal Delimitation: Data collection was conducted over 3 weeks. This study gives an overview of the present scenario and has no historical perspective on how accounting systems evolved over time.

1.8 Limitations

Limitations are factors outside the researcher's control which might influence the validity and generalizability of the results. Limitations are stated explicitly so that one is able to judge how the study contributes:

- Qualitative case study design and generalizability: The adoption of a single case study design using 12 purposively sampled individuals does not allow for generalization statistically to the population of urban councils in Zimbabwe. The results are analytically generalizable to theory in the sense that the study adds to the understanding of the theory of barriers to EMA implementation in financially strapped municipalities, but are not generalizable to argue that all or many councils in Zimbabwe experience such patterns.

- Political sensitivity and response bias: The issue of financial management and environmental performance of a municipal council is politically sensitive. Respondents might have been subjected to some level of self-censorship when discussing their department's activities, painting them in a better light or failing

to reveal anything negative that may paint their colleagues or superiors in a bad light. In order to deal with this limitation, the researcher promised complete confidentiality, employed participant coding instead of names in all the reports, and carried out the interviews privately within an office environment in order to promote openness. Nevertheless, the existence of response bias cannot be ruled out completely.

- Position of the researcher: Being a Bachelor of Accountancy student, the researcher holds a certain discipline perspective which might influence the way he interprets data. The research employs a critical institutional perspective which predisposes the researcher to find decoupling evidence. Although this perspective will help in data analysis, the tendency to focus on what is not outside the framework of the perspective is high. The reflexivity section in Chapter Three will help in this case.

1.9 Definition of Key Terms

Below are operational definitions of the following terminologies in order to establish the conceptual framework of the study. The same terminologies will be used consistently throughout the whole thesis:

- Environmental Management Accounting (EMA): The internal recording, measurement, estimation, analysis and reporting of two forms of information for the purposes of decision making in an organization: (a) physical information on the use, transport and disposal of materials, water and energy, and (b) financial information on environmental costs, income and savings. EMA is different from Environmental Accounting in the sense that it is meant for internal use within an organization and not for external accounting (Schaltegger & Burritt, 2021; Gunarathne & Lee, 2021).

- Material Flow Cost Accounting (MFCA): An operational tool of EMA, standardized in ISO 14051:2011 and concerned with material flow through an organization. MFCA measures material input, output products and material waste emissions in both physical terms (kg, tons, cubic meter) and monetary terms. Material waste emissions in MFCA are not considered as unavoidable overhead

costs but as costed output that has incurred cost of purchase, processing and disposal (ISO, 2011; Zikhali & Makoni, 2024).

- Waste Management Efficiency: The relationship between the financial and physical resources consumed in waste management operations and the outputs achieved.

  In this study, efficiency is conceptualized as a function of EMA implementation: an efficient system is one in which the cost-per-tonne of waste collected is known, monitored, and managed, and in which material losses (uncollected waste, unrecovered recyclables) are valued and minimized.

- Institutional Decoupling: An organisational response to institutional pressure in which formal policies or structures are adopted to maintain external legitimacy, but core operational practices remain unchanged. In the context of this study, decoupling would be evidenced by the presence of environmental policy statements or reporting frameworks that are not accompanied by changes to the chart of accounts, data collection systems, or management decision-making processes (Johnstone, 2020; Nyamwanza et al., 2023).

- Environmental Costs: The costs borne by an organization as a result of its environmental impact. They can be divided into standard waste disposal costs (fuels, labor costs, vehicle depreciation), hidden environmental costs (environmental levies, permits), contingent environmental costs (fines and penalties, settlements), and image and relationship costs (reputational damage) (Virtanen et al., 2013; Schaltegger & Burritt, 2021).

- Hidden Environmental Costs: Environmental costs borne by the organization but remain hidden to its management since they are pooled into overhead expenses instead of being allocated to specific cost objects which incur those costs. Hidden environmental costs under municipal accounting will be legal settlements for environmental pollution posted to the city contingency account rather than the Cleansing Services budget head (Mapfumo et al., 2023).

1.10 Structure of the Dissertation

The structure of this dissertation consists of five chapters. The first chapter contains the formulation of the research problem, aims, questions, importance, assumptions, delimitations, limitations, and definitions of the key concepts. The second chapter contains the review of the relevant theoretical and empirical literature in relation to Environmental Management Accounting, Material Flow Cost Accounting, and institutional decoupling, which allows developing a conceptual framework for the empirical research. The third chapter describes the methodology of the research in relation to qualitative approach and case study, sampling, data gathering tools, and ATLAS.ti 25-assisted thematic analysis. The fourth chapter is devoted to presentation, analysis, and discussion of the empirical results.

1.11 Summary

The background of the study has been developed in the above section. This includes the context of the research, its justification, and the structure of the thesis itself. It was highlighted that Harare faces a solid waste management problem that is also an accounting information problem and that the theory of Environmental Management Accounting provides a theoretical basis to analyze and solve the problem. The research question was stated to be the lack of an integrated system that would link the physical information on waste with the monetary cost information on the same waste. Research questions were developed to identify existing practices on physical information gathering, existing monetary accounting practices, and obstacles in their integration. The importance of the study was explained in the context of practical implications of the study, policy implications, professional implications, and scholarly implications. Assumptions, delimitations, and limitations have been identified and described. The next chapter provides a review of the literature relevant to the study.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

In this chapter, a review of the literature pertaining to Environmental Management Accounting (EMA) is undertaken with focus on EMA applications within municipal solid waste management and problems associated with EMA implementation in the public sector. The review will be divided into four parts. First, the theoretical framework of EMA will be considered, looking at how EMA has been defined since its emergence up until the present time when a critical perspective is predominant that focuses on institutional prerequisites of EMA adoption, adaptation and resistance. Second, a special form of EMA – Material Flow Cost Accounting will be discussed with regard to its technicalities and empirical history. Third, the empirical literature on EMA implementation in developed and developing countries will be critically appraised in terms of the factors contributing to or hindering actual EMA practice. Fourth, the municipal accounting situation in Zimbabwe will be considered, making use of the recent forensic and qualitative research. This chapter will conclude with an identification of the knowledge gap being addressed by the study and with the presentation of a conceptual framework.

2.2 Theoretical Foundations of Environmental Management Accounting

2.2.1 Early Definitions and the Business Case for EMA

Environmental Management Accounting is a term which was developed in the 1990s alongside an increasing awareness of corporations' environmental responsibilities and sustainable development. UNDSD (United Nations Division for Sustainable Development, 2001) prepared a document that defined EMA as the identification, measurement, analysis and communication of both financial and nonfinancial information concerning physical resources used for internal environmental decisions. The definition provided the impetus behind making EMA an entirely different stream of management accounting from external environmental reporting.

Nevertheless, this literature was mainly normative and prescriptive in nature; it focused on what EMA *ought to* do, how organizations *ought to* adopt it, but failed to address

why many organizations were not adopting it or why they were failing to reap the expected benefits. The normative approach became under scrutiny in the 2010s when researchers started exploring institutional theories and sociology to explain the discrepancy between the prescriptions of EMA and practices of the organizations (Qian & Burritt, 2009; Contrafatto & Burns, 2013).

2.2.2 Institutional Theory and Decoupling

The Institutional theory, pioneered by DiMaggio and Powell (1983), can be used to understand how an organisation reacts to its institutional environment. These scholars introduced three mechanisms of institutional isomorphism that are coercive isomorphism which relies on laws and regulations, mimetic isomorphism which depends on uncertainties and imitations of the organizations perceived as successful, and normative isomorphism which is based on professional and educational norms.

However, as Johnstone (2020) has argued in a significant theoretical intervention, the application of institutional theory to EMA adoption has often been overly linear and deterministic. The theory predicts that as coercive, mimetic, and normative pressures increase, organizations will adopt the relevant practice. But empirical observation reveals a more complex reality: many organizations adopt EMA policies, environmental management systems, or sustainability reporting frameworks, yet their core operational and accounting practices remain unchanged. Johnstone (2020) theorized this phenomenon as organisational decoupling, drawing on earlier sociological work by Meyer and Rowan (1977). Decoupling occurs when organizations adopt formal structures or policies to maintain external legitimacy while buffering their technical core from the disruptive implications of those policies.

Johnstone's (2020) contribution is significant for this study because it shifts the analytical question from "Has EMA been adopted?" to "Has EMA been substantively implemented, or has it been ceremonially adopted and operationally decoupled?" This distinction is crucial in the public sector, where municipalities face multiple, sometimes conflicting, institutional pressures: they must demonstrate environmental responsibility to regulators and donors, while also managing tight budgets, political interference, and service delivery crises. In such contexts, the ceremonial adoption of EMA policies—issuing an environmental policy statement, establishing a sustainability committee,

including environmental language in annual reports—may be a rational strategy for managing legitimacy without disrupting established routines and power structures.

The decoupling perspective does not imply that organisational actors are cynical or deceptive. Rather, it recognizes that organizations operate under institutional complexity and resource constraints, and that the adoption of new accounting technologies requires not only formal approval but also changes to IT systems, staff skills, performance metrics, and organisational culture. When these enabling conditions are absent, decoupling is the predictable result, regardless of the sincerity of the policy commitment.

2.2.3 The Gunarathne and Lee Integrated EMA Adoption Framework

Building on the institutional and decoupling literature, Gunarathne and Lee (2021) developed an Integrated EMA Adoption Framework based on empirical research in Sri Lankan municipalities. Their framework integrates three categories of variables: institutional pressures (coercive, mimetic, normative); organisational resources (financial capacity, IT infrastructure, staff expertise); and what they term accounting infrastructure readiness.

The last category is particularly relevant to this study. Gunarathne and Lee (2021) argued that even strong institutional pressure and adequate financial resources will not produce EMA implementation if the basic accounting infrastructure—the chart of accounts, the enterprise resource planning system, the data collection protocols—cannot support the allocation of costs to material flows. Their framework predicts that EMA adoption will be blocked at the level of accounting infrastructure unless this infrastructure is deliberately redesigned to accommodate environmental cost objects.

The Gunarathne and Lee (2021) framework also highlights the importance of cross departmental governance. EMA requires collaboration between accountants, who control the general ledger, and operational staff, who control the physical data. In municipalities where these departments operate in silos, with separate reporting lines, separate IT systems, and separate performance metrics, the organisational conditions for EMA do not exist. Gunarathne and Lee found that the critical success factor in the Sri Lankan municipalities that had implemented EMA was the establishment of a "Cost Transparency Cell"—a permanent cross-departmental team with joint ownership of environmental cost data.

2.2.4 The Professional Norms Gap: Accounting Education and EMA

A further theoretical dimension concerns the role of professional accounting education in shaping organisational practice. Normative isomorphism, in DiMaggio and Powell's (1983) original formulation, operates through professionalization: as accountants are trained in similar curricula and socialized into similar professional norms, they bring similar cognitive frameworks to their organizations. If EMA, MFCA, and environmental costing are absent from the professional syllabus, then normative pressure will not favor EMA adoption; it will favor the continuation of conventional financial accounting practices.

Gibassier and Schaltegger (2020) examined this dynamic in the context of management accountants' roles as environmental change agents. They found that management accountants who had received training in sustainability accounting were significantly more likely to initiate EMA projects and to advocate for environmental cost transparency.

Albelda and Correa (2023) provided a contrasting case from Spanish municipalities, where regulatory mandates for environmental budgeting had created a demand for EMA skills that the professional education system had responded to. Their study found that normative pressure could work in both directions: professional bodies could be a barrier to EMA when they ignored it, but they could also be a powerful driver when regulatory change created demand for new skills. This dynamic is relevant to the Zimbabwean context, where regulatory mandates for environmental cost reporting could potentially stimulate curriculum reform.

2.2.5 MFCA and the ISO 14051 Standard

Material Flow Cost Accounting, standardized under ISO 14051:2011, represents the most operationally specific EMA tool. MFCA is based on the principle of mass balance: materials that enter a system or process must exit either as products or as material losses (waste and emissions). By tracing material flows through a process and assigning costs to both product outputs and material losses, MFCA makes the cost of waste visible. In a manufacturing context, this enables managers to identify the most costly material loss points and to target process imsupportments. In a municipal waste management context, the "process" is the linear flow of solid waste from generation points, through collection and transportation, to final disposal at a landfill or processing facility. The "material

loss" is the waste that is not collected (illegally dumped or burned) and the recyclable materials that are not recovered.

Kokubu and Kitada (2020) reviewed the global diffusion of MFCA since the publication of ISO 14051 and found that adoption had been concentrated in manufacturing, particularly in Japan and Germany, with very limited penetration into the public sector or the service sector. They identified the primary barrier as the requirement for accurate physical measurement of material flows: without weighbridge data, flow meters, or other measurement infrastructure, MFCA cannot be implemented.

Zikhali and Makoni (2024) provided the first empirical study of MFCA implementation in a Zimbabwean municipality, conducting a pilot project at Bulawayo City Council. Their findings were sobering. The pilot could not be completed as designed because the basic physical data—accurate tonnage of waste received at the landfill—was unavailable. The weighbridge at the Richmond Landfill had been out of calibration for an extended period, and waste collection crews used manual tally sheets that recorded estimated volumes rather than measured weights. Zikhali and Makoni (2024) concluded that MFCA, rather than being a tool that can be deployed in any context, is a tool that *diagnoses* the adequacy of an organization's data systems. When those systems are inadequate, the MFCA pilot fails, but the failure itself is diagnostic: it reveals the data infrastructure deficit that must be addressed before any form of EMA is possible.

This finding is directly relevant to the present study. If Harare City Council's physical data systems are similarly compromised—and anecdotal evidence suggests they are—then the first recommendation of any EMA initiative must be investment in basic measurement infrastructure, not the implementation of sophisticated costing models.

2.3 Empirical Literature on EMA in Municipalities

2.3.1 Developed Country Evidence

Qian and Burritt (2009) conducted one of the earliest empirical studies of EMA in local government, examining New South Wales councils in Australia. They found that while councils collected significant amounts of physical environmental data for regulatory reporting purposes, this data was rarely integrated with financial accounting systems.

The primary driver of integration was the presence of an internal champion—an accountant or environmental officer with a personal commitment to sustainability—

supported by top management. Without this combination, physical data remained in the environmental management system and monetary data remained in the general ledger, with no reconciliation between the two.

A more recent Australian study by Williams et al. (2020) examined the impact of state-level waste levy policies on municipal EMA practices. They found that the introduction of a landfill levy, which increased the cost of disposal, created a financial incentive for councils to track waste flows more carefully and to explore diversion options. This finding highlights the role of coercive pressure—specifically, pricing mechanisms—in driving EMA adoption. When waste disposal becomes more expensive, the cost of not measuring waste flows increases.

2.3.2 Developing Country Evidence

The literature on EMA in developing country municipalities is less extensive but has grown significantly since 2020. Gunarathne and Lee (2021), as discussed above, provided a comprehensive analysis of Sri Lankan municipalities. Their finding that EMA adoption was blocked by accounting infrastructure deficits is echoed in studies from other regions.

Nwagwu and Okoye (2021) examined solid waste management accounting in Nigerian municipalities and documented a pervasive pattern of data poverty. Most councils could not provide accurate records of waste generation rates, collection tonnages, or disposal costs. Where data existed, it was collected manually and was not digitized, making analysis and integration with financial systems impossible. The authors argued that this data poverty was not simply a resource problem but an institutional one: the performance management systems of Nigerian local government did not require or reward the collection of accurate environmental data.

Mbelwa and Nyamwanza (2022) investigated the adoption of public sector accounting reforms in Tanzanian municipalities and developed the concept of the "absent metric". They found that municipal accountants' performance was appraised on criteria such as budget absorption rates and timeliness of financial statement submission. Environmental cost efficiency was not a performance indicator. Consequently, accountants had no professional incentive to develop the systems and skills required for EMA.

The absent metric concept is important because it links the technical question of EMA adoption to the organisational behavior question of what managers are rewarded for doing. If the performance appraisal system ignores environmental costs, rational managers will ignore them too.

Arendse and Godfrey (2019), while slightly pre-2020, provided a foundational study of South African municipal EMA that remains relevant. They found that South Africa had a relatively advanced legislative framework for environmental management, including requirements for integrated waste management planning and reporting. However, they also found that municipal accountants lacked the technical capacity to implement the costing systems that the legislation implied. Accountants were described as "financial historians" who recorded past transactions accurately but lacked the forward looking, analytical orientation required for management accounting. This characterization is likely applicable to the Zimbabwean context, where municipal accounting is similarly focused on compliance and transaction recording.

Tauringana and Chithambo (2021) examined environmental reporting practices among listed companies in Africa and found a positive correlation between board environmental expertise and the quality of environmental disclosure. While their study focused on the private sector, its finding is relevant to municipalities: if governing bodies lack environmental expertise, they are unlikely to demand environmental cost information from management.

2.3.3 The Zimbabwean Municipal Context

The literature on Zimbabwean municipal accounting is limited but has grown in recent years, reflecting increasing academic attention to the country's urban governance crisis. Mapfumo et al. (2023) conducted a forensic analysis of the financial statements of five major Zimbabwean urban councils, including Harare. Their most striking finding was the complete absence of environmental liability provisioning. None of the councils had made any provision for landfill rehabilitation, groundwater contamination remediation, or other environmental liabilities, despite known contamination at sites including the Pomona dumpsite in Harare. The authors argued that this omission constituted a prima facie violation of the accruals basis of accounting and the going concern principle. Their study is directly relevant to the present research because it establishes, through

documentary analysis, that the environmental costs of waste management are not recognised in Zimbabwean municipal financial statements.

Mafira and Zhou (2020) analyzed the financial sustainability of Zimbabwean urban councils and documented the challenges posed by hyperinflation, currency instability, and an eroded revenue base. They found that councils operated in a permanent state of financial crisis, with short-term cash management dominating all other considerations. This finding provides important context for understanding why strategic management accounting innovations like EMA might receive low priority.

Nyamwanza et al. (2023) applied Johnstone's decoupling framework to the Zimbabwe Revenue Authority (ZIMRA), finding that sophisticated IT systems used for tax collection coexisted with entirely manual, ignored environmental reporting modules. While their study focused on a different public sector organisation, their finding that IT infrastructure can be simultaneously advanced in one domain and primitive in another is relevant to municipalities. It suggests that the absence of EMA is not simply a function of overall IT capacity but of organisational priorities and the allocation of IT resources.

Chikomo and Dube (2022) examined the role of internal audit in Zimbabwean local government and found that internal audit functions were focused almost exclusively on financial compliance and fraud detection, with no capacity or mandate for environmental auditing. This finding is significant because internal audit could potentially be a driver of EMA adoption if auditors were trained to identify and report on the absence of environmental cost controls.

2.4 Knowledge Gap

The literature reviewed above establishes a strong theoretical and empirical foundation for this study. The theoretical literature, particularly Johnstone (2020) and Gunarathne and Lee (2021), provides frameworks for understanding why organizations might not implement EMA despite institutional pressure to do so. The empirical literature documents persistent EMA failures in municipalities across the Global South, with data poverty, accounting infrastructure deficits, and absent performance metrics identified as key barriers. The Zimbabwean literature establishes that environmental costs are systematically unrecognized in municipal financial statements and that councils operate under conditions of financial crisis that might be expected to crowd out strategic management accounting.

However, no study has qualitatively investigated the specific mechanisms through which physical waste data and monetary cost data are kept institutionally separate in a Zimbabwean municipality. The forensic analysis of Mapfumo et al. (2023) identifies the *outcome*—no environmental liability provisioning—but does not explain the *processes* and *practices* through which this outcome is produced. The decoupling analysis of Nyamwanza et al. (2023) is applied to tax administration, not waste management. The MFCA pilot of Zikhali and Makoni (2024) documents a technical failure but does not provide the in-depth qualitative account of the organisational culture and professional norms that underlie the failure.

This study fills that gap by providing a qualitative, process-tracing case study of the information flows—and information blockages—between the Accounting Department and the Waste Disposal Department at Harare City Council. It asks not only whether EMA is absent but *how* it is absent: through what specific practices, routines, and institutional arrangements are physical data and monetary data kept separate? What do the actors themselves understand about this separation, and how do they explain it?

2.5 Conceptual Framework

Figure 2.1 presents the conceptual framework that guides this study. The framework synthesizes insights from the theoretical and empirical literature into a model that identifies the conditions necessary for EMA implementation and the barriers that can prevent it.

The framework posits that EMA Implementation defined as the integration of physical waste flow accounting with monetary environmental cost accounting is the mediating mechanism that translates Institutional Pressures (regulatory mandates, professional norms, and peer council practices) into Waste Management Efficiency (measurable as cost-per-tonne of waste collected, material loss valuation, and landfill diversion rates). However, this mediation is contingent on the absence of Institutional Barriers. Four categories of barriers are identified, drawing on the literature:

1. Physical Data Infrastructure: The availability of functional measurement equipment (weighbridges, flow meters) and reliable recording systems. Without this, physical waste data cannot be generated with sufficient accuracy for MFCA (Zikhali & Makoni, 2024).

2. Accounting Infrastructure: The presence in the chart of accounts of specific codes for environmental costs, and the capacity of the enterprise resource planning system to allocate costs to material flows. Without this, monetary environmental data cannot be captured (Gunarathne & Lee, 2021).

3. Professional Capacity: The EMA and MFCA competencies of accounting and operational staff, produced through professional education and continuing professional development. Without this, even well-designed systems will not be used effectively (Gibassier & Schaltegger, 2020).

4. Organisational Governance: The existence of cross-departmental mechanisms for data sharing and joint decision-making, and the inclusion of environmental cost metrics in performance appraisal systems. Without this, the informational and incentive conditions for EMA do not exist (Mbelwa & Nyamwanza, 2022).

The framework predicts that when these barriers are present—as the literature suggests is likely in the Harare context—institutional pressures will fail to produce EMA implementation, and waste management efficiency will remain unmeasured and unmanaged.

Figure 2.1: Conceptual Framework

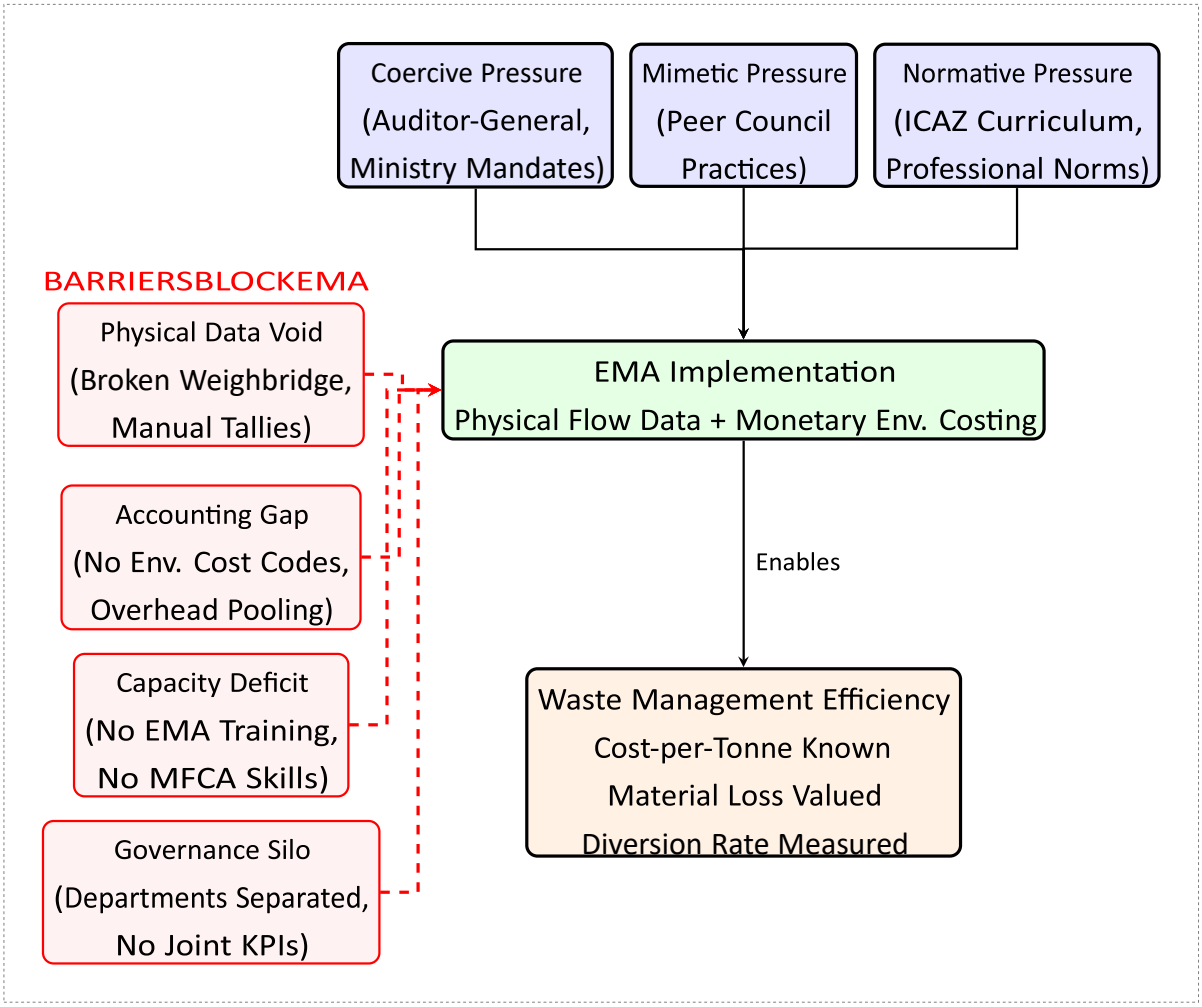

Figure 2.1: Conceptual Framework

This framework serves two purposes in the study. First, it provides a structure for the interview guide, ensuring that data collection covers all four categories of potential barriers. Second, it provides a template for data analysis, enabling the researcher to map the empirical findings onto the theoretical categories and to identify whether any barriers are more significant than others in the Harare context.

2.6 Summary

In this chapter, the theoretical and empirical literature on Environmental Management Accounting is critically reviewed, with particular emphasis placed on solid waste management in developing countries. It is argued in this chapter that, although EMA, especially its application through Material Flow Cost Accounting, provides a theoretically strong framework for managing the costs of waste management, the

empirical evidence shows repeated failure in implementing EMA in the public sector, especially in African municipalities. In this regard, the concepts of organisational decoupling (Johnstone, 2020) and the absent metric (Mbelwa & Nyamwanza, 2022) offer the necessary analytical frameworks for addressing these failures as an institutional phenomenon and not simply a matter of capacity. The following chapter describes the methodology designed to investigate these barriers at Harare City Council.

Chapter 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives an outline and rationale for the methodological approach adopted in this research design and implementation. There are eight major parts of this chapter. To start with, the research philosophy and approach are presented. Next, the rationale for the case study research design is provided. Then, there is a description of the population of interest and purposive sampling. In addition, there is information regarding the semi structured interview guide developed. Next, the data collection process, along with the ethics involved, is provided. After that, the data analysis process is presented. It is based on the use of reflexive thematic analysis, implemented with the help of ATLAS.ti 25 software. Finally, measures to ensure credibility of the results are provided.

3.2 Interpretivist research philosophy.

The theoretical basis for this study is the research philosophy of interpretation. Interpretivism postulates that the social reality does not exist objectively but is formed via social actors' meanings attached to their actions and institutions where these actions occur (Saunders et al., 2019). In relation to this study, the accounting systems of Harare City Council are not seen as objective technical systems that could be evaluated on the basis of the universal criteria. On the contrary, they are seen as social processes, affected by the professional background of accountants and waste managers, political pressure they face, resource constraints they are subject to, and the history of institutional development.

In accordance with this interpretive philosophy, a qualitative research design was chosen. Qualitative research is appropriate for research questions which are exploratory and explanatory in nature, as they focus on processes, meanings, and contexts, but do not seek to measure some variables and test hypotheses (Creswell & Creswell, 2018). The research questions of this study, related to the tracking of physical waste data, monetary cost classification, and factors which impede the integration of these two kinds of data, are of this kind.

3.2Research Design

Instrumental case study design was chosen (Yin, 2018; Stake, 1995). When choosing the instrumental case study design, the case is selected not because of its own interest (even if it is), but because it allows researchers to understand some other more general phenomenon or theory. In this particular study, the case is represented by Harare City Council, as it provides information on the phenomenon of barriers in implementing EMA in City of Harare. The case is considered "instrumental" when it allows researchers to understand institutional, technical, and professional factors of EMA implementation.

There are several reasons why the case study design is especially relevant for this particular study. First of all, research questions are "how" and "why" questions that belong to case study according to Yin (2018). Secondly, the phenomenon studied (EMA implementation) cannot be separated from its organizational context, as it does not make any sense to consider this phenomenon out of organizational context.

3.2Target Population and Purposive Sampling

3.4.1 Target Population

The target population in this case was all the management and supervisory level staff from the two departments within Harare City Council; the first was the Accounting Department (which is under the Finance Directorate), while the second department was the Waste Disposal Department (under the Works Directorate or Cleansing Services). The population size of management level staff from the two departments was estimated to be 48 people, where there were 22 from the Accounting Department and 26 from the Waste Disposal Department.

These two departments were chosen due to the fact that they represent both aspects of the integration of EMA. The Accounting Department oversees the general ledger, the chart of accounts, budget development, and accounting processes, while the Waste Disposal Department oversees physical activities involving waste collection, transportation, and disposal. They also create (or ought to create) the physical data about waste flows.

The interaction between these two departments is the main area of this research.

3.4.2 Sampling Strategy

A purposive, criterion-based sampling strategy was employed. Purposive sampling involves the deliberate selection of participants based on their ability to provide information relevant to the research questions (Patton, 2015). The primary criterion for selection was direct operational responsibility for either financial data management (for accounting participants) or waste operations data management (for Waste Disposal participants). This criterion ensured that participants would have first-hand knowledge of the systems, procedures, and challenges about which they were being asked.

A secondary criterion was hierarchical position. Participants were selected to include a range of seniority levels, from senior management (who could speak to strategic and policy issues) to operational supervisors (who could speak to day-to-day data collection and recording practices). This range was intended to capture both the formal, policy-level account of organisational practices and the informal, ground-level reality.

3.4.3 Sample Size and Composition

Twelve participants were recruited for the study; half were assigned to each department. The number of participants is appropriate for a case study design since the focus is on gaining rich information as opposed to representativeness. As Guest et al. (2006) found out, thematic saturation, defined as the point at which no more themes arise from further data collection, usually occurs in 12 interviews among homogeneous samples. In addition, the two-department setting of this study helped assess whether saturation had been reached since data collection stopped when both groups presented a similar account of organisational processes and challenges.

The final sample composition is presented in Table 3.1.

Table 3.1: Composition of Purposive Sample

Participant Code	Department	Designation
ACC-1	Accounting	Chief Accountant (Expenditure)
ACC-2	Accounting	Senior Management Accountant
ACC-3	Accounting	Financial Accountant (ERP/IT Systems)
ACC-4	Accounting	Budget Officer
ACC-5	Accounting	Internal Auditor

ACC-6	Accounting	Revenue Accountant (Billings & Tariffs)
WST-1	Waste Disposal	Deputy Director of Works (Cleansing)
WST-2	Waste Disposal	Operations Manager (Waste Collection)
WST-3	Waste Disposal	District Cleansing Supervisor (Highfield)
WST-4	Waste Disposal	District Cleansing Supervisor (Mbare)
WST-5	Waste Disposal	Landfill Site Manager (Pomona Dumpsite)
WST-6	Waste Disposal	Fleet Maintenance Coordinator

The sample consists of senior managers (ACC-1, WST-1), middle managers with specialist roles (ACC-2, ACC-3, ACC-5, WST-2, WST-5, WST-6), and operational supervisors (ACC-4, ACC-6, WST-3, WST-4). Through such stratification, the possibility of triangulation is made possible since the accounts of senior managers can be checked for consistency against the accounts of operational employees.

3.5 Research Instrument: Semi-Structured Interview Guide

The research tool used in the study is the semi-structured interview guide. Semi structured interviews are suited for qualitative research due to the balance between a systematic thematic structure of questions and flexibility in exploring new areas (Kallio et al., 2016). Through the use of the guide, the researcher could ensure that all participants would be interviewed on the same issues of interest in the research.

The interviews guide was purposely made to be open and explorative and not leading. Questions were constructed in such a way as to use phrases like "Can you describe...", "How does...", "What challenges...". These phrases were meant to give participants space to express themselves in their own terms without any leading towards researcher's theorized expectations.

3.5.1 Pilot Study

The interview guide was piloted using two senior finance officers from Chitungwiza Municipality, an urban council neighboring Harare and having similar institutional setting. The aim of the pilot study was to see whether the questions posed in the guide were clear, relevant and flowing well. The pilot produced some feedback which led to minor amendments in the interview guide. That is two questions were slightly altered to remove ambiguities while another one was added to probe more on the environmental cost sharing issue. Pilot data were not used for analysis in the actual study.

3.6 Data Collection Procedures

Approval was obtained from the Bindura University of Science Education Research Ethics Committee and permission granted from the Harare City Council Town Clerk's Office, where the permission letter was shown to each participant prior to the interview. The individual consent of the 12 participants was obtained using a consent form that outlined the nature of the research, participation, withdrawal rights, recording of the conversation, and confidentiality arrangements such as participant codes and safe storage of data. Interviews were done face-to-face with participants in their private offices on dates ranging between May 4th and May 22nd, 2026 for a period of 47 to 82 minutes, averaging 63 minutes. Interviews were recorded with audio recordings and reflective field notes that documented the setting, nonverbal communication and analytical insights during the interaction. Data saturation was measured throughout the process with data saturation achieved after coding the data from the Accounting Department in the ninth interview and data saturation in the eleventh interview for the Waste Disposal Department data.

3.7 Data Analysis: Reflexive Thematic Analysis in ATLAS.ti 25

Data analysis was conducted using Braun and Clarke's (2006, 21) six-step reflexive thematic analysis method with the use of ATLAS.ti 25 software. The 12 audio files were transcribed verbatim and were read twice to make marginal notes about the initial impressions. Codes were developed in two iterations: open inductive codes close to participants' language and further deductive arrangement according to the conceptual framework, which resulted in 87 initial codes reduced to 43 upon review for overlapping codes. With the use of ATLAS.ti 25 Network Editor, the codes were organised into four potential themes according to conceptual closeness and co-occurrence: Physical Data Void, Monetary Cost Obscuration, Normative Capacity Deficit, and Politics of Opacity. The themes were examined for internal homogeneity and external heterogeneity and their scope and labels were defined. Analysis was written up with narrative explanations and quotations with regard to the four themes, while ATLAS.ti 25 provided a Thematic Network Diagram and Code Frequency Word Cloud, although the whole process of analysis was undertaken by the researcher.

3.8 Trustworthiness

The trustworthiness of the study was measured against criteria taken from Lincoln Guba (1985). The credibility of the study was supported by the triangulation of sources of data from two different departments and hierarchies, member checking by three participants who agreed that the identified themes captured their experiences, prolonged engagement of a three-week duration where interviews lasted up to 82 minutes, and peer debriefing with the research group. The transferability of the research was assured by offering thick descriptions of the context, samples and methods of data collection and analysis used in the study. The dependability of the research was assured by keeping an audit trail of the ATLAS.ti 25 process of creating and refining the codes and developing the themes and their connections to sources.

3.9 Summary

The qualitative interpretive approach that has been outlined in this chapter is a case study methodology that aims to understand the process of adoption of Environmental Management Accounting at Harare City Council. The single instrumental case study approach helps in the examination of the information exchange process and obstacles between the Accounting and Waste Disposal Departments. The selected 12 respondents at the management level are purposefully selected, thus providing rich information for the analysis. The piloted semi-structured interview schedule helps in covering the research questions and gives some freedom for the discussion of emerging themes. The ATLAS.ti 25 reflexive thematic analysis helps in conducting the analysis in a systematic way and producing some visual results such as a thematic network diagram and a code frequency word cloud. Trustworthiness will be achieved through triangulation, member checking, peer debriefing, audit trail and reflexive account of researcher's positionality. The next chapter provides the results of the analysis.

Chapter 4

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents, analyses, and discusses the empirical results obtained from the 12 interviews carried out at Harare City Council. This chapter is divided into six subsections. Firstly, the ATLAS.ti 25 visual diagnostics—thematic network diagram and code frequency word cloud—are presented as a macro-level map of the thematic structure and vocabulary of the data set. Secondly, the four core themes are presented successively, including the description of narratives, illustrative quotations, and preliminary analysis. Thirdly, the results are discussed with regard to the theoretical and empirical literature on the topic as outlined in Chapter Two, including points of convergence, divergence, and complementarity. Finally, the chapter ends with a brief summarization of the main results, forming the basis for the conclusions and recommendations in Chapter Five.

4.2 ATLAS.ti 25 Visual Diagnostics

4.2.1 Thematic Network Diagram

Figure 4.1 shows the thematic network diagram created using ATLAS.ti 25. Thematic network diagram serves as a visual representation showing how the four major themes and code groups relate to each other. The key point demonstrated by this diagram is the absence of any linkage between the codes representing physical waste data (on the left side of the diagram, blue color) and monetary accounting (on the right side of the diagram, red color).

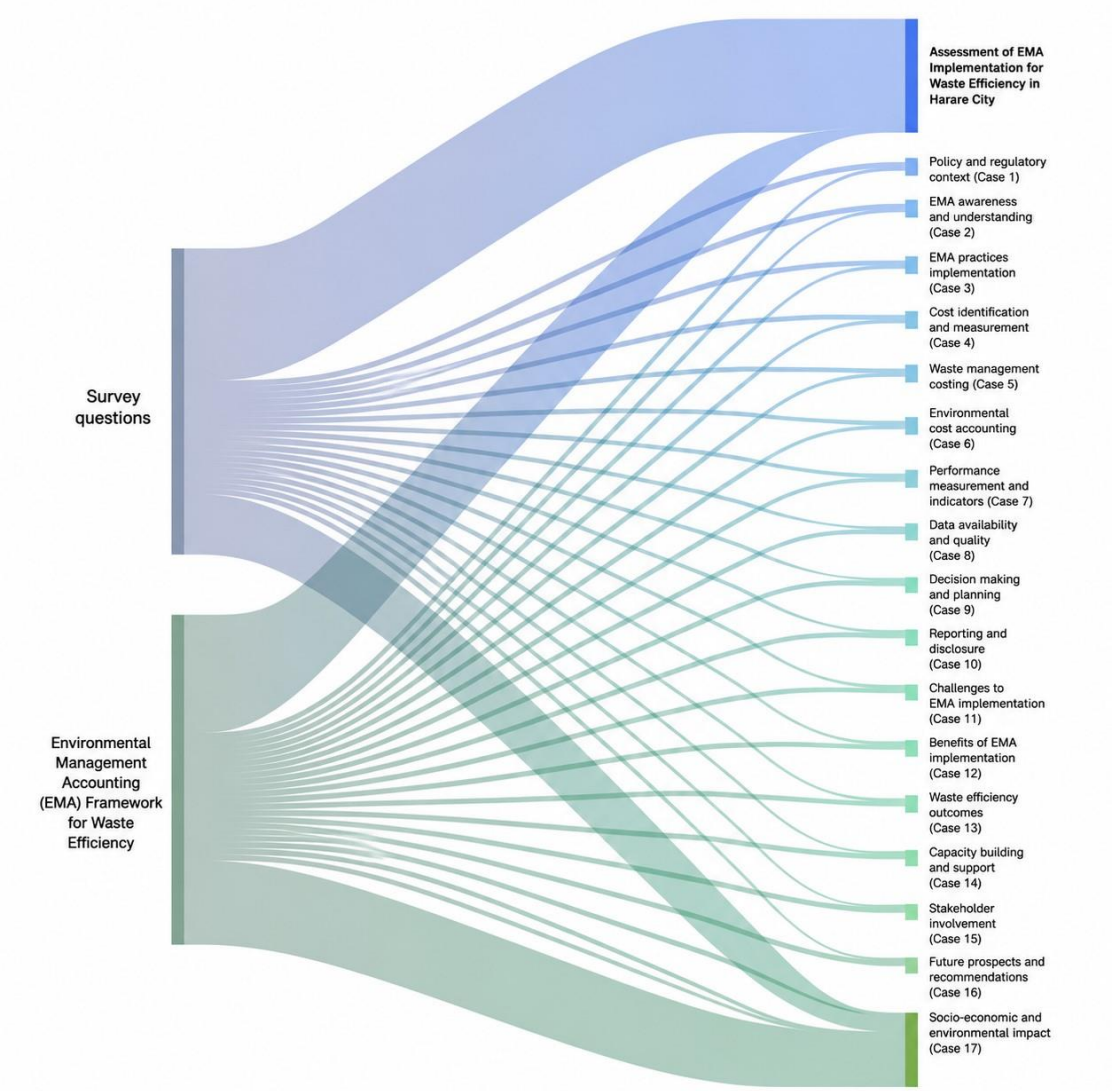

Figure 4.1: Sankey Diagram: Thematic Code Flow Showing Absolute Informational Segregation Between Physical and Monetary Data Systems (Source: ATLAS.ti 25 Sankey Export)

4.3 Theme 1: The Physical Data Void – Estimated Tonnages and Damaged Infrastructure

Theme Definition: This theme deals with how the physical waste flow data is tracked and recorded by the Waste Disposal Department. It includes the practice of manual estimations, the no functionality of the weighbridge at Pomona dumpsite, lack of data verification tools, and the disconnect between physical and financial/managerial data.

4.3.1 Finding 1.1: The “Monument to Neglect”

The weighbridge at Pomona dumpsite is one of the key measurement instruments in terms of both EMA and MFCA approaches. Without correct data on weight, the amount of waste delivered to the landfill will remain unknown, as well as the calculation of cost

per tonne. All participants in the Waste Department agreed that the weighbridge had been not working for a long time and turned into what the Landfill Manager referred to as “a monument to neglect.”

WST-5, the Pomona Landfill Manager, stated:

> *“That weighbridge, I will be honest with you, it has been down for, um, I think coming to two years now. Maybe a bit more. It broke, there was a, something with the calibration, the load cell, and it was supposed to be repaired. But the repair budget, you know how it is, it was diverted somewhere. Another priority. So now it just sits there. The trucks drive past it. Nobody even looks at it anymore. It is like a, what do you call it, a monument. A monument to, you know, how things are.”*



Figure 4.2: Code Frequency Word Cloud: Dominance of Operational Crisis Terminology over Environmental Costing Vocabulary (Source: ATLAS.ti 25 Word Cloud Export, Interview Transcripts, May 2026)

The weighing station being called a "monument" holds analytical value in this regard. A monument is something in the past that cannot function anymore. The description highlights a certain level of resignation and institutionalized acceptance of infrastructural failure. The expression "nobody even looks at it anymore" conveys the sense of normalization of the weighbridge non-functionality.

4.3.2 Finding 1.2: The Culture of Estimation

sAs a result of having a dysfunctional weighbridge infrastructure, the Waste Department came up with another approach for producing information using volumetric estimates and tallying. The way WST-2, the Operations Manager, describes this activity goes like this:

> *"Okay, so what happens is, each truck, we know the capacity, right? A compactor truck, it takes, let me think, about ten cubic meters when it is fully loaded. So, the crew, they record on a, a tally sheet, how many trips they made. And at the end of the day, the supervisor, he multiplies trips by capacity, and that is the figure that goes into the daily report. It is an estimate. We know it is an estimate. But without a weighbridge, what else can we do? We have to report something."*

There are several aspects of this explanation that require closer analysis. First, the procedure of calculation depends on certain assumptions, such as trucks being fully loaded, which may be unrealistic. The efficiency of compaction depends on the composition of the waste, its moisture, and state of the compaction machinery. Second, there is no system of verification in place. The value is not cross-checked with any independent measurement. Third, the rhetorical question by the participant, "What else can we do?", portrays the process of estimation as a necessity.

WST-3, a District Supervisor, provided a more candid account of the estimation culture, revealing that estimation sometimes crosses into negotiation:

> *"To be honest with you, at the end of the month, when we are compiling the monthly report, sometimes we sit with the manager and we, um, we agree on a figure. You know, we look at what we reported last month, and if the trucks were running more or less the same, we put a similar figure. If there were breakdowns, we adjust down. It is not exact. It is, how do you say, a plausible number. Finance has never come back and said this number is wrong. They do not use it for anything, so..."*

The phrase "a plausible number" is refreshingly candid in accepting that what has been reported is not an actual measurement but a construction that satisfies the need for a monthly report due to the bureaucracy, and the fact that Finance never checks the numbers highlights the institutional effect of the lack of a demand for accuracy since the Finance department does not use physical data for anything. Besides the total tonnage numbers, there is no other systematic record kept on the nature of the waste, or how

much of the waste has been recycled and therefore not sent to landfills as the Waste to Energy project at Pomona is run privately and therefore not measured by the council. There is, thus, a clear gap in the data in the sense that even with the functional weighbridge which gives accurate total tonnage numbers, there is still a gap with regards to the composition and diversion information that would be needed for more advanced EMA analysis.

4.4 Theme 2: Monetary Cost Obscuration

This theme addresses how waste management cost is classified, recorded, and reported by the Accounting Department, covering the chart of accounts framework, lack of environmental cost codes, cost pooling into overhead groups, and contingent liabilities externalization. The chart of accounts follows the usual framework for local government organizations, where the cost associated with waste is included in the Cleansing Services account, which was confirmed by ACC-1 to have only standard items such as wages, vehicle costs, repairs, and protective clothing costs, but no line for environmental costs. The inability of the chart of accounts to identify costs associated with an activity comes from the fact that the chart is meant for budgetary controls of inputs and not costing of outputs. ACC-1 confirmed that environmental costs, such as leachate management and illegal dump clean-ups, are allocated to other accounts like repairs and maintenance, making them non-existent and thus unmanageable. The monetary accounting system is therefore a mechanism through which the real cost of waste management is obscured, and Mapfumo et al.'s (2023) finding is confirmed.

Theme three addresses the professional knowledge, skills and attitude towards EMA held by accounting and waste management professionals, which includes professional education, relevance of EMA to the professionals, and the impacts of this professional capacity gap on organisational practices. All accounting professionals admitted having never been trained on EMA, MFCA or environmental cost accounting in their professional education or career so far. The ACC-2 said that he was never taught environmental accounting neither at his degree level nor as part of the ACCA qualification, and ACC-5 mentioned that internal audit training is on risks, controls and fraud detection and not environmental auditing; hence he cannot audit the environmental liabilities. This clearly shows that there is a large normative gap where the professional bodies like ICAZ, ACCA and universities have failed to include environmental

accounting in their curriculum and thereby socializing municipal accountants into the idea that accounting does not include environmental cost. It supports the argument of Gibassier and Schaltegger (2020) that management.

Accountants must rely on cognitive abilities derived from professional education to be environmental change agents. In addition to the lack of EMA education, ACC-3 also showed that the dominant culture is compliance-focused, where it is more important to process transactions, manage the general ledger, and submit financial statements than to perform cost analysis, and there is no KPI that measures cost-per-tonne of waste, providing a direct example of what Mbelwa and Nyamwanza (2022) refer to as an "absent metric," since cost efficiency of the environment is not considered an indicator of performance. The normative capacity gap is also present in the Waste Disposal Department, since WST-4 confirmed that he does not receive fuel invoices and knows nothing about fuel cost per trip, which exemplifies the phenomenon of informational segregation on the operational level, where supervisors responsible for managing collection routes do not have any information about costs to measure efficiency. The normative capacity gap, thus, is one of the structural features of the professional environment: the education system does not supply accountants with EMA knowledge, the performance management system does not encourage cost analysis, and the information system does not give cost information to the operational staff.

4.5 Theme 4: The Political Economy of Opacity — Why Information Gaps Persist

This theme captures the institutional interests, power dynamics, and political factors maintaining the separation of physical and monetary data, encompassing the perceived functionality of information gaps, political interference in resource allocation, and systemic incentives against transparency. The most striking finding emerged when WST-1 admitted with remarkable candor that a real-time cost-per-tonne monitoring system in the Mayor’s office "would be a problem for us" because it would enable questions about district cost variations, crew efficiency, fuel theft, and private use of trucks, revealing that the absence of measurement "serves a protective function" and that "you cannot be held accountable for a metric that is not measured." This extraordinary admission reframes the information gap from passive absence to functional opacity serving the interests of those whose performance would be exposed

by transparent cost data. ACC4 identified this same political economy of opacity at the level of budgeting, pointing out that although transparency is valued in theory, visibility and traceability of all costs would make budget discussions significantly harder, as the present system of budgeting on the basis of precedent makes sense both administratively and politically. This departmental separation is entrenched by organisational structure, since ACC-6 indicated that the reports of the Finance Director and Works Director are separate to the Town Clerk and there is no procedure for exchange of information and cost calculation, making discussion possible only via hierarchy and thus making concrete the institutional separation discussed by Johnstone (2020). In addition, WST-6 contextualized the lack of EMA within the culture of crisis management, where daily breakdowns and cases of cholera require an immediate response and political pressure focuses on clearing rather than tones cleared per cost. This political economy of opacity thus shows that the lack of EMA exists within the context of institutional politics, organisational structure and operational culture, where information gap serves a protective purpose, departmental separation is entrenched by organisational structures, and crisis management crowds out strategic thinking.

4.6 Discussion: Integrating the Findings with the Literature

In summary, the findings provide a complete account of EMA lack within Harare City Council. Non-functionality of the weighbridge and use of estimations support Zikhali and Makoni (2024)’s assertion of the lack of the physical prerequisite for MFCA in Zimbabwean municipalities; however, unlike Zikhali and Makoni’s (2024), this study finds that the lack of the weighbridge is only symptomatic of an underlying pattern of using "plausible numbers" in practice which suggests that even its repair would not suffice as long as there are no institutional transformations that create the need for the accuracy of the data. Moreover, the findings clearly confirm Johnstone’s (2020) theory of organisational decoupling, with the council maintaining the formal façade of environmental management while using traditional accounting techniques; however, this study goes beyond Johnstone’s theory by highlighting the functionality of decoupling from the perspective of organisational actors: the lack of EMA is a "protective function" for the managers which means that decoupling is not only a reaction to organisational complexity but also an opaque strategy pursued by some interest groups in line with the idea of the "absent metric" proposed by Mbelwa and

Nyamwanza (2022). These findings offer validation for each of the elements in Gunarathne and Lee's (2021) Integrated EMA Adoption Framework, with the complete absence of capability in terms of accounting, IT architecture, professionals, and interdepartmental coordination showing that any EMA adoption would have needed a multi-pronged approach, but also providing support for the theoretical framework of the research in the sense that the physical gap in data was maintained by a lack of financial incentive to obtain accurate data, the professional capacity gap by a lack of performance incentives, and the political economy of opacity by the overall rationale for the existence of these gaps.

However, the research only collected views of management level employees in two departments, and it did not consider the views of elected councilors, the Town Clerk, the Auditor-General's department and any external stakeholder; hence, the data provided are incomplete and have been collected from a specific organizational context. The claim that "EMA omission acts as a protective function" is grounded on the frank statement of one manager, and despite this being in harmony with other data, it cannot be said to be the view of everyone in the council. All these are in line with the nature of the study as an interpretive one.

4.7 Summary of Findings

These four themes interlink with each other in explaining why there is no Environmental Management Accounting at Harare City Council. The first theme concerns the physical data system; this one is a void because weighbridge does not function and tonnage is estimated. The second theme – the monetary accounting system – conceals environmental cost information since there are no environmental codes in the chart of accounts, the cost of environmental remediation activities is pooled in overheads, and the contingent liabilities are externalized in other budget votes. The third theme deals with the professional capacity to implement EMA since accounting education does not include environmental costing while performance management does not reward efficient use of resources.

These research findings reinforce the post-2020 literature on EMA implementation in the public sector. These findings clearly support that the barriers to EMA implementation are not individual technical issues but a system, which consists of various components that reinforce each other. This chapter concludes the discussion of these findings.

Chapter 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The current chapter summarizes the results of the research conducted and formulates the final recommendations based on the conclusions made. This chapter contains four main parts. In the first part, the study is summarized by restating the research problem, methodological approach and key findings of the research. In the second one, the conclusions based on the results of the research are formulated in order to provide answers to each research question raised in the introduction. In the third one, recommendations are formulated for Harare City Council, regulatory bodies, accounting profession and future researches. The last part reflects the contribution of the study and its limitations.

5.2 Summary of the Study

The current study aimed to critically evaluate the implementation of Environmental Management Accounting for efficient waste management at Harare City Council. The motivation for conducting the research was the evident contradiction between spending considerable budget on Cleansing Services and inefficient waste management. The study adopted a qualitative, single instrumental case study design. Twelve key informants were purposively sampled from the Accounting Department and the Waste Disposal Department, selected for their direct responsibility for financial data management or waste operations data management. Data were collected through semi-structured, in-depth interviews conducted in May 2026 and were analyzed using reflexive thematic analysis facilitated by ATLAS.ti 25 qualitative data analysis software. Normative Capacity Gap, the third theme, shows that there is no professional accounting education in Environmental Management Accounting or Material Flow Cost Accounting either in universities' curricula or professional bodies' syllabi, which makes it impossible for municipal accountants to learn how to think and work in terms of environmental cost analysis, since they are socialized as professional accountants within compliance-based transaction processing approach, and their work performance

assessment is based on financial reports submission timely manner, but not on cost effectiveness.

Political Economy of Opacity, the fourth theme, shows that physical and monetary information are separated not only because of the technical reasons, but also due to the fact that the lack of performance metrics acts as a shield against managers' inefficiency, and, moreover, departments' silos created by formal organisational structures make impossible the cooperation among the departments which is vital for EMA implementation.

5.3 Conclusions

From the empirical findings, five research based conclusions can be stated. The first conclusion is that the physical waste information provided by the Waste Disposal Department is unsuitable for use in any EMA as this is estimated information and is not measured. This information is also unverified and is not used in any decision-making process by any other department apart from the non-functionality of the weighbridge in Pomona, whose function is to measure any environmental waste material, which means there is lack of measurement information required in order to calculate cost per tonne. Therefore, the physical preconditions for an EMA do not exist since the cost per tonne cannot be calculated. Secondly, the monetary accounting system is systematically structured to prevent any environmental cost identification and management. In this regard the accounting system does not have a chart of accounts for an output costing system but one for input budgeting and therefore there are no environmental cost categories. Additionally, the accounting practice of charging environment related litigation and cleanup costs to other budget votes externals these costs and creates a systematically distorted and incomplete financial view of the department.

Third, the lack of adoption of EMA is not due to one single reason but is due to several mutually reinforcing obstacles which operate on the technical level, professional level, organisational level and political level with technical deficiencies like nonfunctional weighbridge and lack of chart of account being perpetuated by professional deficiencies such as insufficient training in accounting and organisational deficiencies such as structure department separation and lack of cost metrics for environment in performance appraisals, all within an economic politics of opacity in which the lack of availability of

cost information serves the defensive purposes of the organization's members, with these obstacles being mutually reinforcing. Fourth, adoption of EMA is not possible by making some minor changes to the system since the present arrangement of physical infrastructure for data collection, accounting systems, professional capabilities, and organisational incentives is a coherent mutually reinforcing arrangement that makes the implementation of EMA impossible and needs intervention on several fronts including fixing of weighbridges, modification of chart of account, incorporation of EMA in professional education, setting up of cross-departmental governance processes and reforms in performance management, consistent with Gunarathne and Lee's (2021) Integrated EMA Adoption Framework.

5.4 Recommendations

The following recommendations have been made based on the findings and conclusions. In terms of the Harare City Council, the first step to take would be to repair the Pomona weighbridge and set up a maintenance contract because this is an important piece of equipment that will ensure that the EMA is put in place successfully. The Town Clerk needs to create an Environmental Cost Transparency Cell that will be responsible for the review of the chart of accounts and development of a pilot MFCA in the area of Highfield. The environmental cost KPIs like the cost per tonne per district need to be incorporated into the performance appraisals to overcome the "absent metric" issue.

In terms of the Ministry of Local Government and Auditor-General's Office, it may be worth considering the need to legislate environmental cost disclosure in municipal accounts as a means of coercive pressure towards the adoption of EMA while developing environmental auditing capacity at the Auditor-General's Office. As for ICAZ and academic institutions, the two concepts should find their way into professional curriculums and CPD programs, and university researchers should produce Zimbabwean cases of EMA adoption. This research contributes empirically through the first qualitative process-tracing of physical and monetary data separation in a Zimbabwean municipality, theoretically through the concept of functional opacity, methodologically through the demonstration of ATLAS.ti 25 analysis, and practically through recommendations for Harare City Council.

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Appendix A
INTERVIEW GUIDE

SECTION A: Role and Background

1. Can you describe your current position and your main responsibilities within the department?
2. How long have you been in this position, and what previous roles have you held within the council?
3. In your daily work, how do you interact with the [other department: Accounting/Waste Disposal]?

SECTION B: Physical Waste Data Practices

1. Can you describe the process by which waste collection data is recorded, from the point of collection to the final monthly report?
2. What equipment or technology is used to measure the quantity of waste collected or disposed? How reliable is this equipment?
3. Are there any verification or quality control checks on the waste data before it is included in reports? If so, what are they?
4. What challenges do you face in maintaining accurate and timely waste data?
5. How is the waste data used by other departments or by management in decision-making?

SECTION C: Monetary Accounting Practices

1. Can you describe how costs related to waste management are classified in the council's chart of accounts?
2. Is there a specific cost centre or account code for environmental costs, such as landfill management, pollution control, or environmental remediation?
3. When the council incurs costs related to environmental damage (for example, a legal settlement for contamination), how are these costs recorded and reported?

4. Is the cost-per-tonne of waste collected calculated or reported anywhere in the council's financial or management reports?
5. How is cost information used in budget formulation and resource allocation for waste management?

SECTION D: Integration and Barriers

1. Can you describe the working relationship between the Accounting Department and the Waste Disposal Department? How is information shared between the two?

2. In your view, are the physical data from waste operations and the financial data from the accounting system connected or integrated in any way? If not, why not?

3. Have you received any training, during your professional education or subsequently, on Environmental Management Accounting or related tools?

4. What do you see as the main barriers that prevent the council from implementing a system that links physical waste data with financial cost data?

5. If you could change one thing to support the council's ability to manage the costs of waste management, what would it be?

Appendix B
ATLAS.TI 25 CODE LIST

Table B.1: Final Code List (43 Codes Organised by Theme)

Theme	Code	Description
Physical Data Void	Weighbridge non-functional	Pomona weighbridge broken for approx. 2 years
	Manual tally system	Paper-based trip recording by crews
	Volumetric estimation	Tonnage calculated from truck capacity x trips
	No data verification	No independent check on reported tonnages
	Plausible numbers	Conscious construction of estimated figures
	Finance never queries	No external demand for data accuracy
	No waste composition tracking	Organic/recyclable/hazardous not distinguished
	Informal recycling unmeasured	Waste picker activity not recorded
Monetary Cost Hiding	No environmental cost code	Chart of accounts lacks EMA categories
	Overhead pooling	Environmental costs absorbed into general votes
	Litigation externalised	Legal settlements charged to other budgets
	Cleansing Services vote standard	Standard input-based budget structure
	No cost-per-tonne	Efficiency metric never calculated
	Budget absorption KPI	Performance measured on spending, not output

	Contingency fund shielding	Large liabilities hidden in contingency
	Revenue-cost disconnect	Tariffs not linked to service costs

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Theme	Code	Description
	Historical incremental budgeting	Budgets based on precedent, not cost data
	Sage ERP no EMA module	Software lacks environmental functionality
Normative Capacity Gap	No EMA in ACCA syllabus	Professional qualification excludes EMA
	No EMA in university degree	Accounting degrees lack environmental content
	No CPD on environmental costing	No ongoing professional development on EMA
	Compliance-focused culture	Priority is financial statement submission
	Accountant as transaction processor	Role identity excludes cost analysis
	Internal audit no environmental skills	Auditors unequipped for environmental auditing
	Waste staff no access to cost data	Operational staff lack financial information
	EMA not in professional vocabulary	Concept unknown to most participants
	ICAZ no EMA guidance	Professional body has not issued EMA standards
Political Economy of Opacity	Protective function of non-measurement	Absence of metrics shields managers

	Departmental silos	Structural separation prevents collaboration
	No cross-departmental meetings	No formal coordination mechanism
	Crisis management dominates	Short-term response crowds out strategy
	Political interference in resources	Resource allocation driven by politics

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Theme	Code	Description
	Performance metrics absent	No KPIs for cost efficiency
	Town Clerk gate-keeping	Hierarchical communication blocks
	Resistance to transparency	Discomfort with open cost data
	Informal power structures	Actual influence differs from formal hierarchy
	No mayoral demand for cost data	Political leadership does not request EMA
	Fear of accountability	Concern about consequences of measurement
	Council culture of firefighting	Normalisation of crisis response
	History of audit queries ignored	Past recommendations not implemented
	Externalisation of blame	Attribution of failure to external factors
	Staff turnover and institutional memory loss	Loss of experienced personnel

	Donor dependency for infrastructure	Reliance on external funding for equipment