

UNIVERSITY OF GHANA



DEPARTMENT OF GEOGRAPHY AND RESOURCE DEVELOPMENT

**URBAN SOLID WASTE MANAGEMENT CRISIS: AN ASSESSMENT OF THE
ENABLING ENVIRONMENT FOR PRIVATE SECTOR PARTICIPATION IN LA
NKWANTANANG-MADINA MUNICIPALITY**

BY

JOSEPHINE SARPONG

(10703142)

**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF
MPHIL IN GEOGRAPHY AND RESOURCE DEVELOPMENT DEGREE.**



APRIL, 2022

DECLARATION

I hereby declare that this thesis is my own work produced from research geared towards earning the Master of Philosophy degree in Geography and Resource Development under supervision and that, to the best of my knowledge, it does not contain any material previously published by another person or accepted for the award of any other degree of the university, except where acknowledgement has been made.

Signature: 

Date: 17/October/2022

Josephine Sarpong
(Candidate)

Signature: 

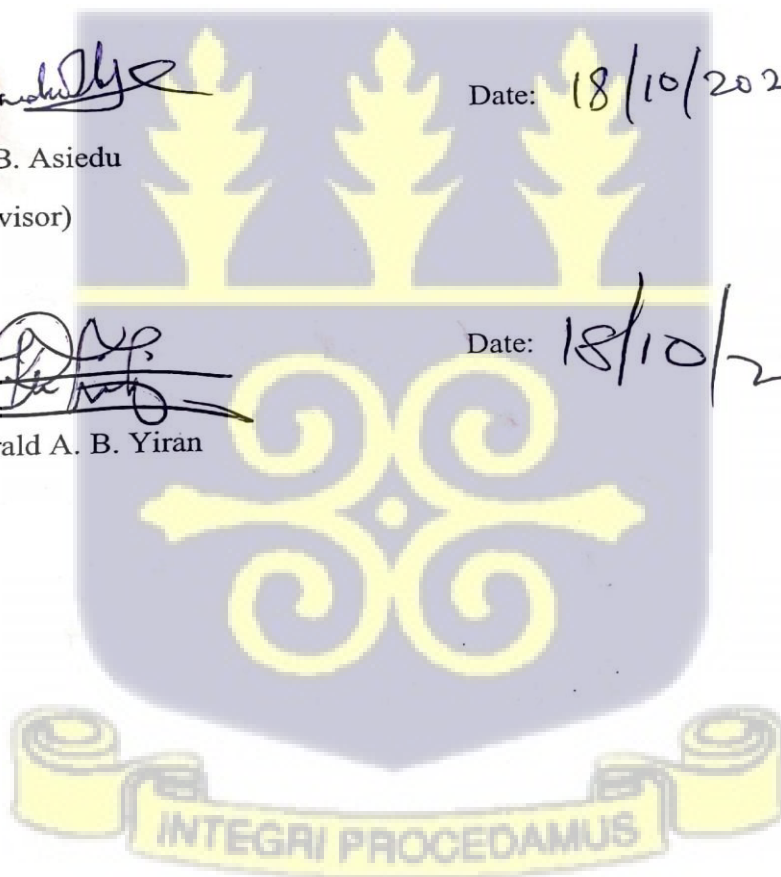
Date: 18/10/2022

Name: Prof. A. B. Asiedu
(Principal Supervisor)

Signature: 

Date: 18/10/22

Name: Prof. Gerald A. B. Yiran
(Co-Supervisor)



ABSTRACT

Environmental concerns have gotten a lot more attention as a result of the growing focus on sustainable development. Waste management, especially sustainable waste management (SWM) appears to be an environmental issue that has gained both study and policy attention. The goal of this study is to assess the enabling environment for private sector participation in the management of solid waste in the La Nkwantanang-Madina Municipality. The La Nkwantanang-Madina Municipal Assembly, private waste management businesses, and residents of La Nkwantanang-Madina Municipality make up the study's population. The Municipality was divided into three socioeconomic classes (high, middle, and low-income residential sectors) based on wealth, population density, housing quality, and various economic criteria. Given the character of the respondents for this study, two (2) key data collection instruments were used: a questionnaire and an interview guide. A total of one hundred and eighty-six (186) sample size was obtained for the households out of 204, representing a response rate of 91%. Purposive sampling was also used to obtain data from specific groups based on their roles in solid waste management in the study area. These included the Municipal Environmental Health Officer, Municipal Planning Officer, Assembly members, and Private Waste Contractors such as Bright Waste Company Limited. The study's findings suggested that there are clear-cut arrangements for handling solid waste in the municipality but there are deficits in the application of these arrangements in the management. The findings also revealed that the solid waste management system in the La-Nkwantanang Madina Municipality is that of collection and disposal. The municipality is currently not treating or recycling waste as far as the management of waste is concerned. The study concludes by recommending that local government entities' technical and financial capacities must be enhanced to help regulate and enforce sanitation laws and bye-laws. It is also very necessary for the government to increase investment in final disposal sites and transfer stations.

DEDICATION

I dedicate this work to my lovely mother, Mrs. Esther Ofori, my husband, Mr. Clement Abaah, the late Samuel Amoah-Darko, and all who believed in me and contributed in diverse ways to its success. May God bless you all.



ACKNOWLEDGEMENT

I am most grateful to the almighty God for his protection, provision of health, and the means to successfully complete this study and programme. I wish to express my profound gratitude to my able supervisors Prof. A. B. Asiedu and Prof. Gerald A. B. Yiran whose advice, guidance, support and critical and constructive comments during this study made it successful. I am equally grateful to the head of the department and the entire teaching and non-teaching staff of the Department of Geography and Resource Development, University of Ghana, Legon particularly Prof. Oteng-Ababio. I say a very big thank you for your support and encouragement. I am indebted to my family, most especially my mother and husband, who through their prayers, encouragement, and financial support pushed me this far.

I am very much grateful to Dr. Louise Kusi and Mr. Kwesi Adarkwa for their assistance and knowledge sharing towards the successful completion of the study.

I am also very grateful to the Municipal Planning Officer, Mr. Frederic Asiamah, and the Municipal Environmental Health Officer, Mr. Emmanuel Queku of the La Nkwantanang-Madina Municipal Assembly for their enormous contribution to the study. To all the Assembly members, waste management companies, and residents of the selected communities in the La Nkwantanang-Madina Municipality, I say a very big thank you for your contribution to the study.

Finally, I say a very big thank you to all my friends and coursemates, especially Abigail Opoku and Eunice Hogba from the Department of Geography and Resource Development, and all those who in diverse ways contributed to the success of this study.

I remain grateful to you all, May God richly bless you

TABLE OF CONTENT

DECLARATION.....	i
ABSTRACT.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENT.....	v
LIST OF TABLES	xiii
LIST OF FIGURES	xv
LIST OF ABBREVIATIONS	xvi
CHAPTER ONE.....	1
INTRODUCTION.....	1
1.1 Background of the Study.....	1
1.2 Problem Statement.....	4
1.3 Research Questions.....	7
1.4 Research Objectives.....	8
1.5 Justification of the Study.....	8
1.6 Scope of the Study.....	9
1.7 Organization of the Work.....	9
1.8 Limitations of the Study.....	10
CHAPTER TWO.....	12
LITERATURE REVIEW.....	12

2.1 Introduction.....	12
2.2 Urbanisation in Ghana	12
2.2.1 The Challenges of Urbanization	14
2.3 Types of Waste	16
2.4 General Outlook on Waste Management.....	18
2.5 Sustainable Waste Management	19
2.5.1 Waste Generation.....	20
2.5.2 Storage of Waste	20
2.5.3 Collection of Waste.....	20
2.5.4 Transportation of Waste.....	21
2.5.5 Disposal of Waste	21
2.6 Stakeholders in Waste Management.....	21
2.6.1 National Governments	22
2.6.2 Regional and Local Governments.....	22
2.6.3 Private Sector Involvement in Solid Waste Management	22
2.6.4 Waste Generators	26
2.7 Overview of Environmental Sanitation Policy of Ghana (2010).....	26
2.8 Concept of Enabling Environment.....	29
2.9 Concept of Public-Private Partnership.....	33
2.9.1 Design - Build – Finance - Operate – Maintain (DBFOM).....	34
2.9.2 Build-Operate-Transfer (BOT), Build-Own Operate-Transfer (BOOT), Build-Transfer-Operate (BTO)	35

2.9.3 Concession	35
2.9.4 Lease, Affermage or Franchise	35
2.10 Challenges of Public-Private Partnership	36
2.11 Waste Generation and Management in Ghana.....	37
2.11.1 Means of Solid Waste Disposal	38
2.11.2 Solid Waste Collection Capacity of Metropolitan, Municipals and District Assemblies	39
2.11.3 Waste Collection Methods in Ghana	40
2.12 Challenges in Waste Management in Ghana	41
2.12.1 Negative Attitude and Behaviour of Citizens	41
2.12.2 Lack of Education and Awareness.....	42
2.12.3 Inadequate Funds and Logistics.....	42
2.12.4 Inadequate Landfill Disposal Sites	43
2.12.5 Lack of Policy Enforcement and Regulation	43
2.13 Theoretical Overview and Conceptual Framework	44
2.13.1 Systems Theory Approach.....	45
2.14 Conceptual Framework.....	47
2.15 Chapter Summary	51
CHAPTER THREE	52
PROFILE OF STUDY AREA AND METHODOLOGY.....	52
3.1 Introduction	52
3.2 Profile of the Study Area	52

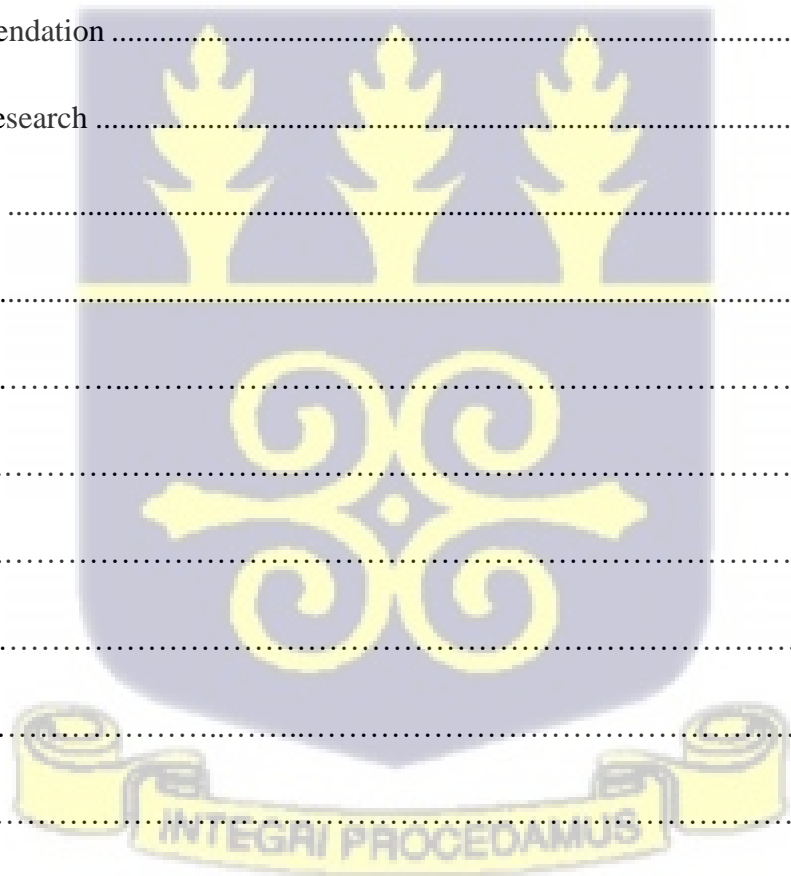
3.3 District Economy	55
3.4 Solid Waste Management	55
3.5 Methodology	56
3.5.1 Research Philosophy.....	56
3.5.2 Research Design.....	57
3.5.3 Research Approach	59
3.5.4 Study Population	59
3.5.5 Sample Size and Sampling Techniques	60
3.5.6 Sources of Data	63
3.5.7 Data Collection	64
3.5.8 Data Analysis	66
3.6 Ethical Consideration.....	66
3.6.1 Access	67
3.6.2 Informed Consent.....	67
3.6.3 Confidentiality and Anonymity	67
3.7 Chapter Summary	68
CHAPTER FOUR.....	69
PRESENTATION OF RESULTS	69
4.1 Introduction.....	69
4.2 Demographic Characteristics of Respondents	69
4.2.1 Age of Respondents	70
4.2.2 Sex and Educational level of Respondents	71

4.2.3 Average Monthly Household Income	72
4.2.4 Sector of Employment	73
4.3 Assessing the Arrangement of Solid Waste Management at the La Nkwantanang-Madina Municipality.....	74
4.3.1 Types and Components of Solid Waste Generated.....	74
4.3.2 Waste Storage	75
4.3.3 Solid Waste Disposal	76
4.3.4 Income Levels and Method of Solid Waste Disposal.....	77
4.3.5 Solid Waste Collection Method by Private Waste Contractors	77
4.3.6 Payment for Solid Waste Collection by Households.....	78
4.3.7 How Much Households Pay Per Month in Ghana Cedis.....	79
4.3.8 Affordability of Solid Waste Collection Charge	81
4.3.9 Does the Service Provided Commensurate With What You are Paying?	82
4.3.10 Households' Views on Ability to Pay for Waste Disposal.....	82
4.3.11 Factors Accounting for Non-affordability of Service Charge	83
4.3.12 The Change of Solid Waste Service Charges Over Time.....	84
4.3.13 Frequency of Solid Waste Collection within a Month.....	84
4.3.14 Adequacy of Rate of Solid Waste Collection	86
4.3.15 Ideal Frequency for Household Waste Collection.....	87
4.3.16 Has there been Situations Where They Have not Collected Waste Within a Specified Period.....	87
4.3.17 Frequency of Waste not Collected on Time	88

4.3.18 Household View on Causes Accounting for the Situation.....	89
4.3.19 How Did You Handle uncollected waste?	90
4.3.20 Where do Private Companies Dispose of the Waste	91
4.4 Assessing the Nature of Partnership Between Private Service Providers and the Municipal Assembly.....	93
4.4.1 Types of Public-Private Partnership arrangement in the Municipal Assembly.....	93
4.4.2 Types of Private Solid Waste Collectors	94
4.4.3 Information on Private Waste Collectors.....	95
4.5 Performances Evaluation of Service Providers and How much Residents are Willing to Pay for Enhanced Services.....	96
4.5.1 How Households Assess Private Waste Collectors	96
4.5.2 How will you Rate the Performance of Service Providers in the Municipality?....	97
4.5.3 Performance Rating of the Two Main Types of Private Waste Providers.....	98
4.5.4 Households' Willingness to Pay more for Waste Collection.....	99
4.5.5 Conditions for Households' Willingness to Pay more for Waste Collectionn	100
4.6 Challenges that Militate Against the Creation of Creating an Enabling Environment for the Private Sector in Waste Management.....	101
4.6.1 Consumers' Perspective of Problems of Solid Waste Collection of Service Providers	101
4.6.2 Challenges Facing Waste Management.....	102
4.6.3 Problems Experienced with Irregular Collection of Waste	103
4.7 Chapter Summary	104

CHAPTER FIVE.....	106
DISCUSSION OF RESULTS.....	106
5.1 Introduction.....	106
5.2 Demographic Characteristics	106
5.3 Assessing the Arrangement of Solid Waste Management at the La Nkwantanang-Madina Municipality.....	107
5.4 Assessing the Nature of Partnership Between Private Service Providers and the Municipal Assembly.....	110
5.4.1 Franchise Agreement (Formal Contractors)	111
5.4.2 Sanitation Improvement Package (SIP).....	112
5.4.3 Pay – as – you – go (Informal contractors).....	112
5.4.4 Assembly Collection.....	113
5.5 Performances Evaluation of Service Providers.....	114
5.6 Challenges that Militate Against the Creation of an Enabling Environment for the Private Sector in Waste Management	115
5.7 Chapter Summary	116
CHAPTER SIX.....	117
SUMMARY, RECOMMENDATIONS AND CONCLUSIONS	117
6.1 Introduction.....	117
6.2 Overview of the Study	117
6.3 Summary of Findings.....	118

6.3.1 Assess the Arrangement of Solid Waste Management at the La Nkwantanang-Madina Municipality.....	118
6.3.2 Assess the Nature of Partnership Between Service Providers and The La-Nkwantanang Municipality.....	119
6.3.3 Evaluate the Performance of Service Providers and Households’ Willingness to Pay more for Enhanced Services	119
6.3.4 Challenges that Militate Against the Creation of an Enabling Environment for the Private Sector in Waste Management.	120
6.4 Conclusion	121
6.5 Recommendation	122
6.6 Future Research	124
REFERENCES	125
APPENDIXES	145
Appendix A.....	146
Appendix B.....	152
Appendix C.....	154
Appendix D.....	156
Appendix E.....	158
Appendix F.....	159



LIST OF TABLES

Table 2.1: Types of Waste	17
Table 2.2: Thematic Areas of Environmental Sanitation Policy of Ghana	27
Table 3.1: Housing Characteristics	54
Table 3.2: Residential Categories and Determination of Sample Size	62
Table 4.1: Age of Respondents.....	70
Table 4.2: Sex of Respondents.....	71
Table 4.3: Average Monthly Income of Households.....	72
Table 4.4: Sector of Employment.....	73
Table 4.5: Components of Waste Generated at Home	74
Table 4.6: How Respondents Store Waste	75
Table 4.7: How Respondents Dispose of Solid Waste	76
Table 4.8: Income Levels and the Solid Waste Disposal Method Adopted	77
Table 4.9: Solid Waste Collection Methods used by Households.	78
Table 4.10: Solid Waste Collection Payment Method by Households	79
Table 4.11: Monthly Charge for Solid Waste Collection	79
Table 4.12: Affordability of Collection Charges.....	81
Table 4.13: Households' Assessment of Waste Collection and its Charges.....	82
Table 4.14: Households' Views on Ability to Pay for Waste Disposal	82
Table 4.15: Factors Accounting for Non-Affordability of Service Charge	83
Table 4.16: Changes in Solid Waste Service Charges	84
Table 4.17: Solid Waste Collection Rate Within a Month	85
Table 4.18: Adequacy of Rate of Solid Waste Collection	86
Table 4.19: Preferred Household Waste Collection Rate	87
Table 4.20: Households' Views on Waste not Collected by Private Contractors	88
Table 4.21: Frequency of Waste not Collected on Time	88
Table 4.22: Household Alternative to Private Waste Collection	90

Table 4.23: Location of Waste Disposal by Service Providers	91
Table 4.24: Types of Private Solid Waste Collectors.....	94
Table 4.25: Information on Private Waste Collectors	95
Table 4.26: Households' Assessment of Private Waste Collectors	96
Table 4.27: Performance Rating of Waste Providers by Households	97
Table 4.28: Performance Rating of the Two Main Types of Private Waste Providers	98
Table 4.29: Households' Willingness to Pay More for Waste Collection.....	100
Table 4.30: Conditions for Paying More for Waste Collection.....	100
Table 4.31: Challenges with Solid Waste Management.....	102
Table 4.32: Challenges Facing Waste Management.	103
Table 4.33: Problems with Irregular Waste Collection	104



LIST OF FIGURES

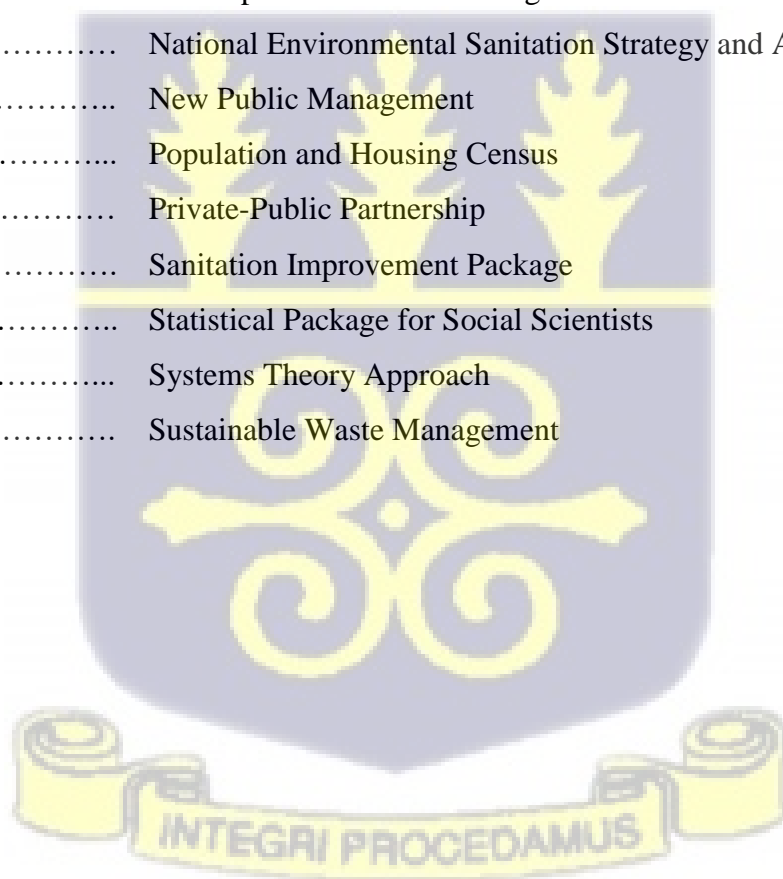
Figure 2.1: Waste management as a system: A conceptual framework.....50

Figure 3.1: Map of La Nkwantanang-Madina Municipality.....53



LIST OF ABBREVIATIONS

BOOT.....	Build-Own-Operate-Transfer
BOT.....	Build-Operate-Transfer
BTO.....	Build-Transfer-Operate
DBFOM.....	Design-Build-Finance-Operate-Maintain
GHS.....	Ghana Health Service
LaNMMA.....	La Nkwantanang-Madina Municipal Assembly
MEHO.....	Municipal Environmental Health Officer
MLGRD.....	Ministry of Local Government and Rural Development
MMDAs.....	Metropolitan Municipal and District Assemblies
MPO.....	Municipal Planning Officer
MSW.....	Municipal Solid Waste
MSWM.....	Municipal Solid Waste Management
NESSAP.....	National Environmental Sanitation Strategy and Action Plan
NPM.....	New Public Management
PHC.....	Population and Housing Census
PPP.....	Private-Public Partnership
SIP.....	Sanitation Improvement Package
SPSS.....	Statistical Package for Social Scientists
STA.....	Systems Theory Approach
SWM.....	Sustainable Waste Management



CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Urbanization is on the increase in most developing countries. In the year 2006, more than half of the world's population were living in urban areas, with the majority of urban dwellers in urban areas in Asia (UN-Habitat, 2014). The drivers of urbanization are still in active motion; therefore, the expectations are that the trajectory of urban growth will proceed unabated, at least in the near future (UN-Habitat, 2013). There are several implications associated with this process. For instance, there is a need for city authorities to prepare in meeting the needs and demands that are associated with urbanization (UN-Habitat, 2013; 2014). Unfortunately, the current situation with regard to urbanization presents despair rather than hope for the future (Asase et al., 2009). This suggestion is based on the poor management by local authorities in most urban areas in Africa and other parts of the global south.

One major social and environmental service that has become an albatross on the neck of city authorities has been the management of waste (Puopiel, 2010). Rapid urbanization, which leads to waste accumulation and increased pressure on urban infrastructure and environmental services, is one of the causes of these unsanitary environmental conditions (Mansur et al., 2016). Solid waste is generated as a result of the activities of man and is considered to have no value for the purpose for which it was earlier used (Abdel-Shafy & Mansour, 2018). A large proportion of the urban waste generated is Municipal Solid Waste (MSW), which according to Hoornweg et al., 2012 has increased in volume over a period, and expectations are that this will continue to be the case as countries continue to urbanize and the demand for food, processed goods and material resources continue to increase (Shekdar, 2009). Municipal solid waste is frequently produced from several sources where diverse human activities are present.

According to studies, households in developing nations produce the majority of the municipal solid waste there, followed by commercial or market areas, with smaller amounts coming from streets, industries, and institutions (Miezah et al, 2015).

Using India as a case in point, it is estimated that with about 377 million people living in urban areas in India, the current waste generated is about 62 million tonnes per year (Waste Statistics, 2019). In Europe, which is largely urbanized, the current waste generated is about 2.538 million metric tonnes (Waste Statistics, 2019). The need to manage waste sustainably has become a policy concern, notably because of the environmental health concerns that arise out of poor management (Karanja, 2002; Awortwe, 2004). Further, if well managed, the potential of recovery and maximizing its use through recycling can have a positive impact on both the environment and the economy.

Ghana's peculiar waste management situation evinces the situation in most parts of the global south, which is characterised by poor management and increasing waste generation in urban areas (Awortwi, 2004; Asomani-Boateng, 2007; Oteng-Ababio, 2011). The volume of waste generated in the Greater Accra metropolitan will increase considerably from 2,654 tonnes a day as of 2010 to an expected 3,390 tonnes by 2020 (Oteng-Ababio, 2011). It was discovered that Ghana generates 0.47 kg of waste per person (Miezah et al, 2015). In comparison to municipalities (0.40 kg/capita) and districts (0.28 kg/capita), the average household waste generation rate in metropolitan areas was high at 0.68 kg/capita (Miezah et al, 2015). For instance, the Greater Accra metropolitan area's per capita waste generation rate is 0.72kg per person per day (Accra Metropolitan Assembly, 2021), and the La Nkwantanang Madina Municipality produces about 171 metric tonnes of solid waste daily (LaNMMA, 2022). This increase is taking place within the context of poor governance, changing consumer consumption patterns, difficulties in raising finance to address insufficient budgetary

allocations, and lack of political commitment (Oteng-Ababio, 2011). The fallout of these constraints is manifested by the serious environmental challenges that metropolitan and municipal areas in Ghana are currently bedevilled with. These include litter found on roadsides, drains, and gutters choked with waste materials, and piles of uncollected garbage found in public spaces such as markets.

The experience thus far with regard to waste management is that it has been the responsibility of the government, normally acting through the local government (Fobil et al., 2008; Kurian, 2006). Unfortunately, the increasing cost involved in the management of waste coupled with the increase in waste generation per day has incapacitated the government in keeping up with the pace with regard to waste collection and disposal. This situation has implications on other vital sectors of the economy, especially on the health of the citizenry (Oteng-Ababio and Malera, 2014). About 85% of reported cases at outpatient facilities in the country are due to diseases linked to poor sanitation, such as malaria, diarrhoea, intestinal worms, and acute upper respiratory tract infections (Addaney & Oppong, 2015).

According to Hotor (2017), the main causes of poor sanitation in Ghana could be attributed to many factors among which are poor planning, weak institutions, ineffective behavioural practices, and weak governance. Furthermore, there are ineffective enforcement regimes contribute to the state of poor liquid and solid waste management. Additionally, there are policy gaps that affect the effective coordination, resourcing and management of the key institution within the Ghanaian sanitation sector. Over time investment within the sanitation sector has not been prioritized (Appiah-Effah et al., 2019). Further, poor waste management has been linked to other related environmental problems such as flooding (AMA, 2010). It is within this context that the partnership between the public and private sector has been identified to be the

crucial way forward in relation to Municipal Solid Waste Management (WSWM). The reason for the private sector inclusion has been that this arrangement will improve efficiency in service delivery since the private sector can bring in the needed finance and also logistic capabilities (Oteng-Ababio et al., 2013; Baud and Post, 2001).

Further, by engaging in competitive bidding process in the selection process of a private entity to partner with the government, it will facilitate the selection of the best private entity with the wherewithal to manage the sector (Oteng-Ababio, 2010). Other scholars have also argued that it will enable the local authority to discharge more of an oversight or supervisory role which will also enable it to build competence in this role over a period of time (Kurian, 2006). Suffice to state that the argument for the involvement of the private sector poses a greater chance to succeed if the purpose is to manage waste effectively and efficiently. However, the pressing issue and one that requires some interrogation is the fact that the private sector cannot operate in a vacuum. There is a need to put in place the needed regulatory regime and framework to guide their operations (Pires et al., 2011). Furthermore, the needed environment to enhance their efficiency and viability of work is also of the essence. This certainly will not emanate only from efforts by the private companies, but also investments from the public sector to be viewed from a different perspective. (Liyala et al., 2011).

1.2 Problem Statement

The increased attention to sustainable development has significantly increased attention to environmental issues (Barkemeyer et al., 2014). One environmental issue which seems to have attracted both research and policy attention is waste management, more specifically Sustainable Waste Management (SWM) (Oppong, 2016). The interest in SWM stems from the fact that it is one of the most pressing environmental issues that is becoming difficult to deal

with in the global south (Oduro-Kwarteng, 2011). Moreover, the mishandling of the MSW can potentiate environmental problems such as flooding as well as environmental health issues (Oteng-Ababio, 2014). Further, managing waste efficiently is in synch with the global agenda of addressing the brown issues in developing countries (Oteng-Ababio, 2014). Brown issues refer to the immediate and pertinent environmental problems which affect a large number of people, especially poor households who are most unable to access basic social and environmental services.

Although significant investments have been made to address the challenges of effective waste management in urban Ghana, waste management is still a problem that is getting worse (Yoada et al., 2014). Given Ghana's rapid urbanization in municipalities, the multifaceted nature of the SWM problem can best be understood (Oteng-Ababio, 2010). Urban and peri-urban areas in Ghana exhibit the most glaring shortcomings in solid waste management (SWM). The worsening solid waste situation in many Ghanaian urban areas has been a major concern for the government and the native population as a whole. The rapid growth in business activity and population in Ghana's municipal capitals has created several difficulties, which have been accompanied by a rapid rise in the amount of solid waste produced by production and consumption activities (Fei-Baffoe et al., 2014). Ghana, like other developing nations, has struggled with municipal solid waste management due to infrastructure and technical shortcomings over the years (Addaney & Oppong, 2015).

In both developed and developing countries, private sector involvement in infrastructure development has grown in importance over time (Olukanni & Nwafo, 2019). Public-private partnerships (PPP) are expected to improve service delivery, mobilize resources, reduce risks, and contribute to economies of scale (Oteng-Ababio, 2010). The government's inability to meet its financial obligations to the private companies contracted to collect and dispose of waste in

their respective jurisdictions has prevented PPP from being as effective as it could be in reversing the situation (Addaney & Opong, 2015).

Solid Waste Management challenges have received considerable scholarly attention over the years, and these studies have closely investigated the problem from different dimensions.

Studies on the private sector's participation in solid waste management in developing countries, including Ghana, have shown increased coverage (Post, 1999; Oduro-Kwarteng & van Dijk, 2013; Oteng-Ababio 2007, 2009), but there are still difficult issues with contracts, policy, and private sector performance. For instance, Oduro-Kwarteng & van Dijk (2013) examined the impact of increased private sector involvement in solid waste collection in five cities in Ghana and found that there was an increase in the use of competitive bidding, contract signing, and city-wide user charging. While Yoda et al., (2014) looked at perceptions of private sector waste management in urban areas, Post (1999) emphasized the main difficulties facing the privatization of waste in metropolitan areas.

Moreover, Owusu-Sekyere (2014) observes that city managers have embraced public-private partnership (PPP) approach as a sustainable means of solid waste management. Oteng-Ababio (2007; 2009) also looked at private-public partnership in SWM in Accra. The key conclusion of Oteng-Ababio's (2007) study was that there is a need for a collaborative framework that works best, and must include the informal sector whose role is critical in some residential areas, while also championing acceptability and participation of all stakeholders in the process (Oteng-Ababio, 2009). Other studies have looked at the challenges encountered in waste collection, transportation and disposal in Ghana (Boadi and Kuitinen, 2003; Oteng-Ababio, 2011). Further research has been conducted looking at the potential of integrating recycling

within Ghana's SWM strategies and the associated challenges (Oteng-Ababio et al, 2013; Oteng-Ababio, 2014; Buerterey, 2018).

In their investigation into the crucial issues surrounding municipal solid waste management in Ghana, Addaney & Oppong (2015) made the recommendation that the government create a conducive working environment that is market-oriented, technically sound, and legally friendly for all actors with an interest in solid waste management. To what extent the La Nkwantanang-Madina Municipality has been able to foster an enabling environment presents a gap that this study needs to fill.

Following the rapid urbanisation spurred by internal growth and migrations and the concerns of addressing the predicaments faced by private waste management operators, it has become imperative to identify areas that can be improved to strengthen existing partnerships in solid waste management within the La Nkwantanang-Madina Municipality. In this light, this study seeks to identify the gaps in research on the subject by evaluating the role played by private sector entities in the sustainable management of waste within La Nkwantanang-Madina Municipality and also explore the existing conditions under which they perform this role.

1.3 Research Questions

The study addresses the following questions which will be the focus of the research:

- I. What is the current policy arrangement guiding waste management operations in the Municipality?
- II. In what ways has the current private-public partnership arrangement improved the technical capacity of service providers and Assembly?
- III. How do residents assess the operations of service providers?

- IV. How much are residents willing to pay for improved services?
- V. What are the major challenges associated with solid waste management in the municipality?
- VI. Who are the key stakeholders in creating an enabling environment for the private sector participation in solid waste management in the municipality?
- VII. What are the challenges faced by these stakeholders in performing their roles?

1.4 Research Objectives

The study's main objective is to assess the enabling environment for private sector participation in the management of solid waste in the La Nkwantanang-Madina Municipality. The specific objectives that will guide the study are as follows;

- i. Assess the arrangements for the delivery of solid waste management in the La Nkwantanang-Madina Municipality.
- ii. Assess the nature of the partnership between service providers and the Municipal Assembly
- iii. Evaluate the performances of service providers
- iv. Examine the challenges that militate against the creation of an enabling environment for the private sector in waste management in the municipality

1.5 Justification of the study

Creating enabling environment to improve the effectiveness of private operators in the management of MSW is critical to our urban and sustainable development. However, this demand that attention is given to key issues such as regulatory framework, capacity building issues and other challenges that militate against the smooth operation of the private sector

involved in SWM. This is even more important for smaller municipal and local authorities since they are mostly constrained by human capital, experience and skills required in working out and implementing some of these partnerships. Towards unravelling the nuances of some of these issues, the research and its findings will aim at proposing areas that require policy attention.

Private-public partnership as a conduit for effective environmental services provision has received significant attention from scholars. Several theoretical and analytical frameworks have been developed on what might work best. Nonetheless, Oteng-Ababio et al., (2013) have indicated that a one-size fit all might not be the best solution as different countries have different experiences, institutional bottlenecks and on-the-ground challenges that need to be taken into account. This study intends to illuminate local peculiarities and how this may have to be factored into extant models of private-public partnerships.

1.6 Scope of the Study

Contextually, the study categorized waste into two main forms (solid and liquid). The study then focused on the policy measures that enable private sector participation in sustainable Solid waste management. Though there were other waste companies functioning in the Municipality, the study focused on the formal waste companies contracted by the Assembly.

1.7 Organisation of the work

This research is organized into six chapters. Chapter one introduces the study by exploring the background of the study and understanding the context within which the study is being conducted. Within the same chapter, an attempt is made to frame the core problem of the study.

The second chapter reviews empirical literature and elaborates on the set of existing scholarly ideas on the general outlook of waste management and narrows it down to waste management issues in Ghana. It also presents private sector involvement in solid waste management as well as the challenges of sustainable waste management practices in Ghana. The conceptual and theoretical frameworks guiding the study are also highlighted in the chapter. The third chapter presents the specific methods and techniques taking into account the research design and approach in the study. The areas covered under this section also include the study population, sampling techniques, sample size, data sources, data collection procedures, ethical considerations, the location and size of the study area, and conditions of the built environment among others. The results of the study are presented in chapter four of the study. Charts, tables, cross-tabulations and figures were used to simplify the data gathered and discussed in the context of the study. The fifth chapter presents an in-depth discussion of the study results relating them to the literature reviewed.

The sixth chapter also presents the key findings of the study, conclusions and made some recommendations to enable the creation of an enabling environment for private sector participation in Ghana.

1.8 Limitations of the study

This study, like many others, had limitations. One of the difficulties was receiving data from respondents promptly. Limited funding and resource constraints also affected the researcher's ability to engage more participants. The data was collected at the peak of the COVID-19 pandemic, due to this, access to respondents was also a major challenge following the various restrictions limiting face-to-face interactions. This problem was exacerbated as there was no data at the Assembly containing the names and contact details of residents for possible phone

or online interviews with respondents. Finally, it is expected that these limitations would serve as a guide for future research.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section of the study presents an empirical review of relevant literature of the study. It provides elaborations on the set of existing scholarly ideas on solid waste management. The chapter begins with the general outlook of waste management and narrows down to waste management issues in Ghana. It also presents the engagement of the private sector as well as the challenge of waste management practices in Ghana. The conceptual and theoretical frameworks guiding the study have also been highlighted in this chapter.

2.2 Urbanisation in Ghana

Since Ghana gained its independence, its population has experienced not only rapid growth but also rapid urbanization, which has led to an increase in the number of urban settlements in the country. The percentage of the nation's population that resides in towns, as defined by the government as any community with at least 5,000 residents, has increased significantly over time. It went from 9.4% in 1931 to 13.9% in 1948, 23% in 1960, 28.9% in 1970, 31.3% in 1984, and 43.9% in 2000 to 50.9% in 2010 (GSS, 2014). According to data from the Ghana Statistical Service, the proportion of the population living in urban areas increased from 23% in 1960 to 29% and 32% in 1984 and 2000, respectively, before reaching a record high of almost 51% in 2010. Urban population growth was noted to have been 4.7% annually between 1960 and 1970, 3.3% between 1970 and 1984, and 4.6% between 1984 and 2000 (GSS, 2014). Several factors have contributed to Ghana's shift from a predominantly rural to an urban population; in 2010, more than 50.9% of the country's population was estimated to live in urban areas (GSS, 2014). According to Ghana Statistical Service (2014), there are three main contexts in which to think about the causes of urbanization. The rising level of urbanization in Ghana is

due to a combination of high rates of natural population growth in towns and cities, rural-urban migration, as well as the reclassification of villages with over 5,000 inhabitants into towns, according to the census definition of an urban centre in Ghana.

According to the literature, natural increase has also played a significant role in the country's overall population growth, particularly after independence, when migration to the towns became more long-term and permanent and wives migrated to the towns with their husbands. In addition, Kwame Nkrumah's (Ghana's first Prime Minister after Independence) vigorous urban industrial development program created economic opportunities in the cities and made them popular tourist destinations, which sparked a significant rural-urban migration in the country. In addition, the general lack of opportunities in rural areas as a result of their exclusion from the development process is a driving force behind rural-urban migration (Songsore, 2003).

Greater Accra continues to be Ghana's most urbanized region. Next to Greater Accra, Ashanti Region is the most urbanized, with nearly 61 % of its residents residing in areas that were designated as urban in 2010. (GSS, 2014). According to the results of the 2000 census, between 1984 and 2000, the population of the Accra Metropolitan Area increased at a rate of 4% per year, compared to a national population growth rate of roughly 2.6% per year. This is because Accra attracted migrants from all parts of Ghana, but particularly from its neighbouring regions, specifically the Volta, Eastern, and Central Regions. The study area, Madina, is the tenth largest town in the country and is located to the north of Accra. It grew quickly, from 7,480 in 1970 to 28,364 in 1984 to 76,697 in 2000 and currently has a population of 244,676 in 2021 with 84.6% in its urban areas (PHC, 2021). It is also interesting to note that Ghana has urbanized along this corridor since the colonial era along the triangular trade route of Accra,

Kumasi, and Sekondi-Takoradi, with the Accra-Kumasi corridor being the most active area of urbanization. Therefore, it can be concluded that the location of Ghana's trade areas and urbanization are directly related. Since trade is a key factor in determining Ghana's economy, the majority of the population frequently relocates to these areas in search of what they perceive to be greener pastures, which contributes to the ongoing population growth in these areas (GSS, 2014).

2.2.1 The challenges of urbanization

Rising urbanization will worsen not only the socioeconomic conditions of urban residents, but also the environmental conditions in which they live, work, learn, and pray in a rather impoverished nation like Ghana where cities lack adequate infrastructure (i.e., housing, roads, health and educational facilities), jobs, and services for environmental maintenance (e.g., water, sanitation, and waste disposal). Urban settlements in Ghana are characterized by problems of a demographic, socioeconomic, and environmental nature because of the unmanaged urban growth process (Oduro-Kwarteng, 2011). Ghana has a serious problem with rapid population growth, which also seems to be the cause of many other urban problems. The constrained infrastructure and services in the cities are coming under increasing pressure due to the rapid growth of the urban population. The severe housing shortage, heavy traffic, and crowded hospitals, schools, banks, and other service facilities characterize Ghana's major cities. Water, sanitation, and waste disposal services that are necessary to maintain the urban environment are also overburdened, which has an impact on both the environment and public health in cities. Ghanaian cities also struggle with socio-economic issues in addition to the population pressure issue. Low productivity, rising rates of underemployment and unemployment, urban poverty, and destitution are all symptoms of a weak national economy (Oduro-Kwarteng, 2011). Many urban residents are being driven into social vices like crime

and prostitution as a result of their difficult economic situation. Furthermore, a wide range of environmental issues, such as unplanned developments, poor drainage, inadequate sanitation, slum development, and extremely bad traffic conditions, characterize urban settlements in Ghana. Chaos has resulted in the physical development of the cities as a result of the inability to plan for and regulate the rapid growth of urban settlements (Songsore, 2003).

Rapid urban population growth necessitates the availability of enough housing to accommodate this growth. Numerous factors, including the severe housing shortage and the high cost of renting housing in cities, are encouraging many people to build their own homes, while others are motivated by the possibility of making significant financial gains to invest in housing development. As a result, housing and other developments are happening quickly around cities, but municipal assemblies and other institutions for urban management seriously lack the resources to plan and oversee these developments. Due to this, many of the most recent housing developments in cities are unplanned and many of them are taking place in locations without land use plans. This situation is leading to haphazard urban development throughout the nation, which has detrimental effects like poor road access within the cities, which makes it difficult to provide utilities, emergency services, and environmental services like waste collection. Urban areas in Ghana also have significant drainage issues (Oduro-Kwarteng, 2011).

Furthermore, an already troublesome waste situation is made worse by the production and consumption activities of the expanding urban populations, which result in increasing volumes of waste. Random waste disposal practices by the general public, such as littering and dumping trash into drains and streams, frequently obstruct existing drainage channels and gutters, obstructing the flow of stormwater out of cities. Many streams and drains overflow their banks during extended periods of heavy rainfall, which are frequent during the rainy season, and flood

waters rush through homes and roads, causing property damage and occasionally claiming lives. Due to inadequate drainage systems, floods have become a yearly occurrence in many low-lying areas of cities like Accra, Kumasi, Sekondi-Takoradi, and Tamale. Most Ghanaian cities also have appalling conditions for sanitation (Oduro-Kwarteng, 2011).

The census report states that due to the high cost of construction and the requirement for piped water for its use, the water-closet toilet, which was only accessible to 8.5% of the population in 2000, is not common in Ghanaian households. Several air and waterborne diseases spread because of sanitary conditions issues in rapidly growing urban and suburban areas. About 85% of reported cases at outpatient facilities in the nation with seasonal epidemic outbreaks of cholera are acute upper respiratory tract infections, intestinal worms, malaria, and diarrhoea, which are examples of diseases related to poor sanitation (Addaney & Oppong, 2015).

2.3 Types of Waste

Waste can be classified into various categories. Evidence from the global north indicates that the management of the different waste categories is instrumental in the development of appropriate waste management policies which are geared towards the attainment of sustainable waste management (El-Haggar, 2017). The problems posed by waste have many dimensions including social, environmental and economic and represents one of the key challenges faced by many urban areas across the world. The waste challenges are a result of increasing consumption and the use of non-biodegradable materials and the growth in population (Ilic and Nikolic, 2016). Though there is a general increase in waste generation across the world, developed countries seem to have better waste management systems than developing countries where waste management has become a major economic and environmental issue. (Singh et al., 2011).

In a much broader term, all waste generated within the city or an urban area is called municipal solid waste (Tchobanoglous and Kreith, 2012). Municipal, because the waste is generated within a jurisdiction or a municipality within the urban setting. Other forms of waste include industrial waste, agricultural waste and hazardous waste. A deeper appreciation of the volume and the nature of municipal waste is a vital element in the formulation of cost-effective strategies for managing waste. The per capita waste generated in developed countries is higher compared to developing countries (Karak et al., 2012). However, institutional capacity and resource availability, both human and technical have significantly facilitated proper and a more sustainable waste management (Sarkis, 2011). This is evident in both the practice of waste management from the household to the municipal levels. Table 2.1 presents the various types of waste generated in the study area.

Table 2.1: Types of Waste

Type of Waste	Source	Components
Municipal Solid Waste	Households, offices, hotels, shops, schools and other institutions.	Food waste, paper, plastics, rags, metals, glass
Industrial Waste	-Manufacturing/ processing firms -Waste treatment plants	Metals, plastics, leather, cloth, wood, food processing waste, ceramics, stones, etc.
Agriculture Waste	Livestock waste Crop waste Forest products Agro-industrial by-products	Production of rice, palm oil, rubber, coconut, timber, sawdust, off-cuts and charcoal, cotton, sugarcane, rice, wheat, jute sticks, etc.
Hazardous Waste	-Hospital and healthcare facilities waste -chemical production -Nuclear power plants	chemical, petrochemical, petroleum, metals, wood treatment, pulp and paper, leather, textiles and energy production plants (coal-fired and nuclear power plants)

Source: Woodard and Curran Inc. (2016)

2.4 General Outlook on Waste Management

Waste has been defined by Eurostat (2019) as materials and substances (either liquid or solid) generated in the house, workplace or any other place which have outlived their use and are being discarded for disposal. Waste is commonly called trash in the United States while it is called refuse/rubbish in the United Kingdom (Zaloksnis, 2018). Examples of wastes produced include; containers, food wastes, yard wastes and inorganic wastes from commercial, institutional and residential activities. Waste production has become a serious threat to the environment over the years and this has been the result of increased population growth and change in lifestyle which has a consequential impact on increased consumption (Nelson, 2018). This problem of waste management seems to be more pronounced in emerging and developing countries where capacity, resources and logistical challenges have characterised local and central governments (Nelson, 2018).

According to Shankar (2017), the statistics on global waste generation have been on a meteoric rise, with global estimates suggesting that in 2018 alone over 1.5 billion tonnes of solid waste were generated globally. The figure is expected to increase to 2.2 billion tonnes by the year 2025 if mechanisms are not put in place to control the rapid rate of waste generation. Coupled with the burgeoning increase in waste production has been inadequate access to proper waste management (Adams et al., 2014). Indeed, it is reported that about 3.5 billion people in the world have no access to waste management services and hence resort to open dumping (Shankar, 2017). This situation has serious environmental and health implications, especially in most low- and middle-income countries.

The contributing factors to the complex nature of waste generation and management are a result of rapid urbanization due to industrialization amid increasing population and economic activities (Idowu, 2013). Reports on global waste production clearly demonstrate that some regions are worse off in regard to capacity to manage the problem (Porta et al., 2010). It is evident that in these countries, waste is poorly disposed and landfills are improperly managed leading to several environmental and health issues. Several studies (Porta et al., 2010; Mattiello et al., 2013) have found that improper siting and management of waste disposal sites in developing countries causes leachate from waste to leak into the soil and water, burning of waste in the open, and inability to recycle waste materials does not only have health and environmental risks but also economic crises. Unfortunately, the urban poor are the people that suffer the most when it comes to waste management issues as they are found to be living closer to waste disposal sites (Vergara et al., 2012). They are exposed to cancer, annoyance, and respiratory diseases (Jarup et al., 2014).

2.5 Sustainable Waste Management

Ribić et al., (2017), described sustainable waste management as the collection, transportation, valorisation and disposal of the various types of waste, in a manner that does not jeopardize the environment, human health or future generations. The purpose of sustainable waste management is to decrease waste generation and also how to economically and judiciously use resources which will ensure that the amount of waste produced from one sector of the economy will be used as a raw material in another sector. It is built on the principle of the three (3) R's that is reuse, recovery, and recycling. According to Minghua et al. (2009), waste management can be grouped into five (5) main components. They include; waste generation, storage of waste, waste collection, transportation of waste, and disposal of waste.

2.5.1 Waste Generation

The generation of waste is the first stage of the waste management cycle. It is the stage where an individual sees an item as useless and valueless. The substance has no use to the owner as they do not require the usage of the item again. The individual then decides to get rid of the item by disposing them off. It must however be noted that items that may not be of value for one individual and require to be disposed of may be of good value to the other (McGrath, 2016).

2.5.2 Storage of Waste

The next stage of the waste management cycle is storage. It involves keeping waste for a temporal period before it is collected and sent to the final disposal site. This requires the provision of improved storage facilities so that individuals can have ease of disposal. This also requires the efficient and timely collection of waste at the storage points. In determining the number of storage points at a particular place, the type of waste, walking distance and frequency of emptying must be considered (Matsuda et al., 2012). The various storage facilities that could be used include; small containers, large containers, shallow pits, and communal pits (Matsuda et al., 2012).

2.5.3 Collection of Waste

This refers to how waste is gathered for transportation to final disposal sites. According to Madu (2017), an efficient collection system requires that measures are instituted to ensure that waste is collected at regular times to prevent the storage facilities from being over-flooded with waste. Madu (2017) further suggests that the system for an efficient collection of waste must also be efficient in estimating the volume of collected waste for transportation and disposal to avoid pressure at the final disposal sites.

2.5.4 Transportation of Waste

This is when waste is sent to the final disposal sites after being collected from storage points. According to Lilja (2016), there are different modes or methods for disposing of waste. However, the stage may depend on the nature and quantity and nature of the waste generated. In the opinion of Lilja (2016), the methods can be grouped into three broad categories, namely; human-powered which consists of wheelbarrows, tricycles, etc. animal-powered (donkey-drawn cart) and the third being motorized means of transport which involves the use of a tractor, trailer, standard truck, tipper-truck, amongst others.

2.5.5 Disposal of Waste

This is the last stage of the waste management process and it deals with the safe disposal of waste. This stage deals with minimizing the risks and other environmental health issues associated with improper disposal of waste. In the view of Romvall et al. (2011), four main methods are often associated with waste disposal. These include; land application which involves burial or landfilling (dumping of solid waste), composting, burning or incineration, and recycling (resource recovery). Land application is the most common among all the methods and it is very common with how waste is managed in developing countries (Romvall et al., 2011).

2.6 Stakeholders in Waste Management

The implementation of waste management strategies varies from one country to the other as different roles and responsibilities are assigned to various players to perform (Daddi et al., 2016). Pires et al. (2011) further note that the stakeholders generally consist of waste generators, policymakers, waste management agencies, and reviewers of activities of

stakeholders in waste management. The aforementioned players are essential in developing a robust management system for waste. The various stakeholders have been outlined below;

2.6.1 National Governments

The ultimate role of a national government is the development of an integrated waste management policy with diverse strategies for tackling how waste should be handled in the country. They are concerned with establishing policy and regulatory frameworks and also providing a conducive environment for other stakeholders such as the private sector and other ancillary government agencies in the management of solid waste (Ojeda-Benitez et al., 2013).

2.6.2 Regional and Local Governments

In most cities, the real practitioners of waste management are Regional and Local Governments. Murray et al. (2017) note that the governments at local and regional levels are the key managers of waste issues and also formulate programmes aimed at achieving a sustainable waste management system with key components being reuse, recovery, and recycling. There are two main approaches to the interactions between these various actors in waste management. These are “a top-down or bottom-up approach” relationship between National Governments, Regional and Local Governments in dealing with the implementation of waste management policies in many countries (Murray et al., 2017).

2.6.3 Private Sector Involvement in Waste Management

In both developed and developing nations, private sector participation in infrastructure development has become increasingly important over time (Olukanni & Nwafo, 2019). Metin et al. (2013) state that governments alone cannot handle all issues related to waste management in many countries. Therefore, in their view partnership with the private sector is considered instrumental in the sustainable management of waste. In recent times, the private sector has

become an important stakeholder in waste management (Metin et al., 2013). Normally, they come in with business models that does not only ensure efficiency in the service delivery but also increase returns from their investment. McBean et al. (2015) explain that the private sector provides major waste management products, facilities, and services as well as innovative and alternative solutions to the waste management conundrum that many developing countries are bedevilled with. McBean et al. (2015) further note that the economy stands to gain from the involvement of the private sector since they create employment directly and indirectly for those within the waste management chain which includes both formal and informal sectors. It is anticipated that the involvement of the private sector will give users the chance to take part in decisions about the types of systems, technology, standards, and quality of services that will be provided to them in addition to allowing them to pay for the cost of service delivery. Involving the private sector has been advocated for developing nations to increase efficiency and effectiveness and address government shortcomings in the provision of direct public services, including an excess of employees, a dearth of supervisors, a lack of performance incentives, and financial constraints (Cointreau-Levine, 1994).

In most developing nations, private sector involvement in solid waste collection began to pick up steam in the 1990s. In 1994, the World Bank recommended private sector participation, and through capacity building and equipment loans, development partners have backed the initiative for private sector participation in solid waste collection and management. Since then, developing countries like Ghana have seen an increase in the number of private companies engaged in the collection of solid waste (Oduro-Kwarteng & van Dijk, 2013). In Ghana, the Urban Environmental and Sanitation Project (UESP), established in 1999 by the World Bank and the Ghanaian government, was implemented in five of the largest cities (Ziai, A. (2016). The World Bank provided both financial support and technical assistance for the privatization

of garbage collection under this project. The public sector's inefficiency and the rising financial burden on local governments served as a backdrop to this. Government shortcomings in providing direct public services, such as having too many employees and not enough supervisors, and insufficient financial resources, were to be overcome by the private sector. As a result, the solid waste collection services were contracted out and franchised to the private sector. According to Awortwi (2004), this policy of private sector participation in solid waste management is a component of the decentralization of local service delivery to local governments and the extension of the market mechanisms of the New Public Management.

The World Bank's policy initiative to involve the private sector in solid waste collection has two goals. Firstly, it is to ensure that the environmental component of sustainable development is integrated into solid waste management. Lastly, it is to increase efficiency (reduce cost) and effectiveness of service delivery (service quality) through competition in the market. Private sector providers compete for a zonal monopoly to render service over a period of time. It is believed that the private sector is endowed with characteristics like political independence, economic sanity, efficiency, dynamism, and innovation, making it compare favourably to public sector enterprise (Awortwi, 2004). A specific zone was assigned to each company under this form of privatization. The government instead subsidizes the cost and allows the beneficiaries to pay a portion of the total cost rather than pushing the entire burden onto the beneficiaries. 10–20% of the total cost is covered by the customers. Billing and collecting user fees are expenses that private businesses must bear on their own. This type of privatization was chosen because generators of waste should contribute to the costs of waste management (limited polluter pay principle). According to the experts, this was done to warn people to make every effort to lessen the amount of solid waste they produce. Additionally, it was done to assist the government in lowering the enormous sum of money it spends on solid waste management.

Although these positive effects cannot be taken for granted, there is still little empirical evidence to support privatization's effectiveness, much of which is based on Western experiences. Although necessary, this restructuring of waste management operations has not produced the all-encompassing benefits anticipated, with only 60–70% of the waste produced in the cities being collected (Hettiarachchi et al., 2018)

Depending on government control and private economic scale, private sector involvement can take many different forms, from service contracts, leasing, joint venture, concession, and full privatization to the provision of a service to outright ownership of facilities. A contract serves as the framework for the arrangement between the private seller and the public purchaser. A service contract is the most basic type of private sector involvement. The essential elements of contractual exchange are the contract's specifications and terms, which define roles and responsibilities, service standards, performance evaluation procedures, guidelines for price adjustments, and sanctions (Van and Verhoest, 2016). Private agents must possess the necessary capacity to enter into contracts, create and carry out business plans, and, most importantly, provide services that satisfy local governments and the general public. Only then will they be effective and efficient in raising the quality of service delivery. It was established that poor service delivery quality results from private agents' inability to meet many of these capacity requirements (Awortwi, 2004).

Private agents may be unable to operate in developing nations due to internal organizational issues, issues with inter-organizational arrangements, and issues with the external environment (policies, legalities and regulation) (Oduro-Kwarteng & van Dijk, 2013). There are four performance and contractual issues with increased private sector involvement in the delivery of public services, despite the justification for it. First, there are issues with how to create

benchmark measures to assess the performance of the private sector and market structures for service delivery - diffuse or concentrated organization structures. Second, private sector management is likely to pose challenges to how public sector services are organized; in particular, the equity and coverage goals of the public sector might not be met if there are no incentives to serve the underprivileged areas. Thirdly, the nature of partnership contracts - contractual requirements, ambiguous descriptions of duties, and trust - may raise concerns about the results or performance gains of the new arrangement. Last but not least, the power imbalance between partners may result in opportunistic behaviour due to information gaps and a lack of political commitment, which can cause significant issues for the contracting parties (Rothenberger et al., 2005 cited in Oduro-Kwarteng & van Dijk, 2013).

2.6.4 Waste Generators

These are individuals/institutions that produce waste either through commercial or private activities. They discard items which are of no value to them. They may include consumers of goods and services and industries that generate waste (Laner et al., 2012). Other stakeholders in the waste management system that have been identified include opinion leaders, Non – governmental Organizations, waste experts and academics, teachers and other educators, traditional authority, and religious organizations, amongst others (McBean et al., 2015).

2.7 Overview of the Environmental Sanitation Policy of Ghana (2010)

Ghana's first Environmental Sanitation Policy was passed in 1999 to tackle the numerous challenges associated with the management of waste in the country. This policy was revised in 2009 to meet current waste management issues in the country in line with the goal of the National Development Policy Framework. The current policy was approved in April, 2010. The key agencies responsible for the implementation of the Environmental Policy and

Sanitation are the Ministry of Local Government and Rural Development, the Ministry of Environment, Science and Technology, the Ministry of Information, Metropolitan, Municipal and District Assemblies (MLGRD, 2010).

The Environmental and Sanitation Policy of Ghana (2010) has the goal of developing a clear and nationally accepted and recognised vision of sanitation and environmental services as a major element meant to improve the health conditions of the people in the country. The policy is further developed under various themes based on the various challenges identified. They are discussed as follows;

Table 2.2: Thematic Areas of Environmental Sanitation Policy of Ghana

Theme/Focus	Challenges Identified	Specific Objectives/Targets
Capacity Development	<ul style="list-style-type: none"> • Lack of clear national goal on environmental sanitation • Inadequate allocation of resources • Inadequate manpower 	<ul style="list-style-type: none"> • To formally establish environmental sanitation as a sub-sector in the development planning system with clearly defined institutional mandates • To strengthen coordination and collaboration among sector institutions • To develop the capacity of the sector for effective facilitation of MMDAs and the private sector for the provision of environmental sanitation services
Information Education and Communication	<ul style="list-style-type: none"> • Widespread littering/ indiscriminate dumping of refuse • Lack of sector-wide standards for service provision • Increasing waste generation 	<ul style="list-style-type: none"> • To raise awareness of the benefits of improved environmental sanitation especially as related to health, food hygiene and the general environment • To provide sector-wide standards for service provision, taking into consideration local conditions and needs
Legislation and Regulation	<ul style="list-style-type: none"> • Weak and poorly enforced sanitation laws • Inadequate sector-wide standard for service delivery 	<ul style="list-style-type: none"> • To develop legislation in support of institutional structures required for managing environmental sanitation • To make available to all sector actors updated sector-wide

Theme/Focus	Challenges Identified	Specific Objectives/Targets
		standards, laws and regulations on environmental sanitation
Sustainable Financing and Cost Recovery	<ul style="list-style-type: none"> • Low levels of funds allocated to the sector • Non-economic tariffs charged for services • Low level of revenues collected by service providers • Inadequate allocation of financial resources 	<ul style="list-style-type: none"> • To ensure sustainable financing of environmental sanitation services • To develop a strategy and financing plan with a clear allocation of resources (and costs) for households, communities, MMDAs and central government
Levels of Service	<ul style="list-style-type: none"> • Inadequate provision for the vulnerable and physically challenged • Increasing discharge of waste from mining and other industrial 	<ul style="list-style-type: none"> • To effectively contain and decrease the negative impact of poor environmental sanitation • To support adequate treatment and final disposal of all wastes
Research and Development	<ul style="list-style-type: none"> • Inability to develop technologies to avoid groundwater contamination • Inability to collect data for planning purposes 	<ul style="list-style-type: none"> • To develop an effective framework for capturing, reporting sector statistics and performance to users at all levels • To support research in appropriate technologies to meet the needs of all segments of society, especially vulnerable and poor people
Monitoring and Evaluation	<ul style="list-style-type: none"> • Non-existence of M & E plan • Non-existence of transparent and accountability measures 	<ul style="list-style-type: none"> • To develop a framework for monitoring and evaluation at all levels within the sector • To strengthen capacity to implement M&E

Source: MLGRD, 2010

The implementation arrangements start with the roles of the community which sees environmental sanitation as a public good. The next identified actors are associated with the individual responsibilities and community programmes being run by CBOs and NGOs. Again, the private sector is seriously encouraged to participate in environmental sanitation services through full cost recovery, franchise, concession, and contract agreements (MLGRD, 2010).

After a thorough review of the Environmental Sanitation Policy of Ghana, it was observed that there is no specific focus or theme dedicated to creating an enabling environment for private

sector involvement in environmental sanitation in the country. Even though the policy makes mention of the private sector and spells out some responsibilities as a stakeholder or as part of the institutions for environmental and sanitation control, there are no clear measures and activities stated in the policy meant to create that necessary working environment for the private sector to thrive when it comes to waste management. This research, therefore, is aimed at filling that knowledge gap by investigating the specific activities government does to provide the private sector with a conducive environment to operate well in the waste management industry.

2.8 Concept of Enabling Environment

The concept of enabling environment has no clearly defined or standardised definition. However, all the definitions provided by scholars have centred on issues relating to laws, rules and regulations that help the private sector to efficiently deliver public service, government support to the private sector and the relationship between public entities, the markets and entrepreneurs (Altenburg and von Drachenfels, 2007). These public services may include infrastructure, education, health, water, sanitation, agriculture, good governance and rule of law. McBean et al. (2015) also mention that the concept also refers to the international enabling environment for private sector development and growth which involves international trade and investment activities and the macroeconomic environment.

The concept of enabling environment is embedded in the ideas of neoliberalism (Tennberg et al., 2014). This is an approach to governing that has spread in different variations across the globe in the last three decades (Harvey 2007). Neoliberalism has provided an extension of market relations and competition throughout society, including the realm of social interactions (Larner, 2000). The main elements of neoliberal governance are support for the free movement

of goods, people and capital; re-distribution of authority between governmental and non-governmental entities; pro-market regulation; and an emphasis on social innovations that will advance individual freedom and responsibility (Cerny et al. 2005). Neoliberalism in practice has been woven into a broad range of international, national and regional plans, programmes and strategies in the form of deregulation, privatization and rationalisation. It favours private enterprise and seeks to transfer the control of economic factors from the government to the private sector. With the advent of the neoliberal approach, the state became a passive actor in development from its initial active role. It, therefore, marked the beginning of the private sector as a key instrument of development (Rodrik, 2004). Therefore, the neoliberal approach abhors state interventions, arguing that the private sector will develop better when it responds to the forces of the market, with the state guaranteeing a free competitive market and property rights (Küblböck and Staritz, 2014). Indeed, advocates of neoliberalism opine that private enterprises and entrepreneurial initiatives are the keys to innovation and wealth creation (Harvey, 2007). The role of the state was therefore to enforce contracts, maintain order and generally put in place conditions that allow markets to function (Leiva, 2008; Harvey, 2007). In that regard, the purpose of the approach was modernization through privatization, which meant shifting the engine of growth from the state to the private sector, marking the rise and significance of the private sector in development.

According to the International Labour Organization (ILO) (2014), private firms cannot stay in a vacuum and expect to have sustained growth. Firms, whether public or private need to operate in the current socio-economic frameworks and must be subjected to regulatory and institutional arrangements within a country (ILO, 2014). It is established that governments are not able to produce all public services due to limited budgetary allocations, limited human resource capacity and constraints on technical capacities. It is in light of this that private firms are

normally roped in to take over the provision of some or all aspects of the provision of public services under specified control mechanisms.

Whiles, it is important that the private sector complements and partners with the government in the delivery of public services, ILO (2014), mentions that issues that constraints effective delivery of the private sector needs to be addressed, since without that it will be very difficult for firms to produce to achieve maximum growth for sustained development. According to OECD (2017), enabling environment for the private sector can be grouped into two (2) categories. They are; policy/institutional level which entails the investment capacity or business enabling environment ranging from international, national and sector-specific policies such that trade and industrial reforms are geared towards creating the necessary push and institutional capacities for sustained production of public services. The second category has to do with the marketing functions of firms in areas aimed at addressing market failures created by local actors and the government. This looks at infrastructure, access to finance and labour force (OECD, 2017).

Elaborating on measures that are relevant for creating a conducive environment for business growth, DCED (2016) notes that fostering private business growth requires four types of government tools to support local business, and these tools when implemented seek to enable, encourage and empower private businesses. They include: “providing information, setting rules (regulatory environment), supporting private business access to financial resources and building infrastructure and capacity” (DCED, 2016, p. 6).

In addition to the above, Kwak et al. (2009), have also argued that providing an enabling environment also requires that the government provides a fair ground for private sector participation in the bidding process for a government contract and this will require a transparent procurement process where information on the process is available for all firms. Further, some scholars have also suggested that in the context of most developing countries where a lot of the businesses are small and medium-sized (Kwak et al., 2009). Thus, government programmes should also take into consideration the instrumental nature of these businesses in the life of the economy. Given this, some have advocated for interventionist policies, where the government select some of these small and medium-scale businesses to build their capacities to function effectively and efficiently.

Further, one area that is important in providing an enabling environment involves government enforcement capacities of the regulatory framework it has set to guide the operations of private businesses (Oteng-Ababio, 2007). This is essential since, in all this, the government is the entity required to protect the interest of the public, while also balancing that with providing a business environment where the private business will be both profitable and efficient (Oteng-Ababio, 2007). Government capacities also involve the resources at its disposal to build the required infrastructure e.g. power required to enhance business operations. Capacity also involves technical and human resource capacity.

For this study, enabling environment has been defined to be all the conducive and necessary measures in the form of policies, projects, programmes and activities meant for the private sector to deliver public services which previously were being provided by the government per agreed terms and conditions for a specified period of time.

2.9 Concept of Public Private Partnership

The concept of Public Private Partnership (PPP) is explained to be the contractual arrangements that deals with the transfer and control of public good and services either in full or in parts from the central government to the private sector (Hutchinson, 2016). The public partner is typically represented by the local government at the national, state, or local agency level and the private partner can be a privately owned business or group of businesses with a particular speciality whose primary goal is profit realization (Olukanni & Nwafo, 2019). PPP encompasses a wide range of activities which the private sector provides in the form of participation in public sector services delivery and management (Donaldson and Wagle, 2015). The rationale for the PPP arrangement is that no government or agency can single-headedly provide the needed public services as a result of the ever-increasing needs of faster growing population populace (Googins and Rochlin, 2010).

The use of innovative operational methods reduced cost of production, environmental conservation, and improved access to capital investment by private sector actors which is found to be more efficient has heightened the interest in applying PPPs around the world (Nwali et al., 2019; Ramanadham, 2011). Formal and informal businesses play a critical role in the provision of services by decentralizing responsibilities in the form of public-private partnerships. In contrast to privatization, which transfers ownership of the service or business to the private sector, PPPs aim to increase investment and system efficiency while the government still retains ownership (Awortwi, 2004). The government retains ownership of the assets and a larger portion, if not all, of the risk when it merely contracts with the private sector to provide a basic service (Olukanni & Nwafo, 2019). Because of issues with externality and excludability, many of the services that the government retains ownership of are typically viewed as public or merit goods. While the public sector is ultimately responsible for providing services in PPPs, the private sector is now in charge of actually delivering those services as a

result of contractual agreements (Awortwi, 2004). When a government divests or privatizes a property, it gives the private sector full or partial control of the asset. The public and private sectors share a significant amount of risk in PPPs, which are viewed as alternatives to full privatization (Olukanni & Nwafo, 2019).

The distinguishing factor used to set public-private partnerships apart from other forms of private sector involvement is the element of risk-sharing in investments. There are risks associated with the various private sector involvement activities that do not involve investment risk, but these risks are not investment risks. Private companies' investments in a brand-new fleet of vehicles and treatment facilities over the course of a specific contract period enable the recovery of depreciation in the case of solid waste collection. Establishing a partnership is one aspect of the private sector's involvement in investment risk (also known as public-private partnerships; this can be done with or without competition or a change in ownership). To achieve cost-effectiveness, minimize expenses, and improve service delivery, private sector involvement aims to introduce market competition, private sector management and technical expertise, and private financing into the delivery of public services (improve service quality) (Oduro-Kwarteng & van Dijk, 2013). Public Private Partnership agreements can take different forms, including;

2.9.1 Design - Build – Finance - Operate – Maintain (DBFOM)

This type of PPP has contract arrangements which describe the functions given to private sector actors in the provision of public infrastructure. These mostly require the expertise and capacity of the private sector in; designing, building, financing, operating and maintaining a facility for a period after which the facility is transferred back to the government. This type of agreement is normally required for the implementation of new projects (Ian, 2017).

2.9.2 Build-Operate-Transfer (BOT), Build-Own Operate-Transfer (BOOT), Build-Transfer-Operate (BTO)

Yong (2010) indicates that this approach to Public Private Partnership is also ideal for new projects. Here, the private firm is given the right to construct the project, operate the facility for some time and later on transfer ownership to the government when the contract terms are exhausted.

2.9.3 Concession

It is used in the context of public private partnership to mean contracts which deal with user fees and payments (Farquharson & Yescombe, 2011). This practice is very common in South America. Brazil with the enactment of the Concession Law regulates PPPs in such a way that there are user-pays contracts signed between the government and private entities. What this means is that the private operator provides the service or constructs the project, and then charges the government for the service that it will deliver per the contractual arrangement. In this situation, all that the government does is pay for the service. This is similar in Chile, Argentina, Columbia, and Peru where the government pays for the service delivered to the public on contractual agreements private sector. This type of agreement applies to both new and existing development projects (Tonci, 2013).

2.9.4 Lease, Affermage or Franchise

This PPP arrangement is applicable to only existing development facilities. It shares similar characteristics with concession just that the government remains the principal agency for capital expenditures. This refers to handing over existing public facilities to be managed by the private sector (Anton, 2017). With a lease, the private sector makes and retains revenue generated by running the facility and does a specified lease payment to the government. Affermage agreements require that both the private and government share the revenue

generated from the facility (Delmon, 2010). With a franchise, the private sector is required to make investments and carries commercial risks. This form has been used in the provision of urban busing and rail systems across Europe (Yescombe, 2013). In Ghana, city authorities are now collaborating with the private sector in urban waste management mostly in a franchise agreement.

2.10 Challenges of Public Private Partnership

According to Ke et al. (2010), achieving improvements and success in the implementation of PPPs in public service delivery requires conscious efforts from governments. Many governments are faced with the issue of not being able to create adequate incentives and an environment for the private sector to achieve efficiency and maximum satisfaction. In most cases, governments at various levels are unable to structure policies that ensure that PPP arrangements become beneficial to end users and for a lifetime. This problem confronting many countries, especially low-income countries is due to failure on the side of governments with regard to available and adequate resources and skills needed in managing public private partnership projects (Ameyaw and Chan, 2015).

According to Ameyaw and Chan, 2013, PPP contractual issues, for example, unsolicited projects with inherent monopoly, underperformance of contractual obligations leading to poor quality of services, lack of managerial skills by the public contracting authorities and subsequent failure to ensure effective management of purchase agreements are the major challenge associated with public private partnership in Ghana. Again, challenges in ascertaining value for money for PPP projects, public affordability concerns and the high cost of PPP procurement as well as the complexity of project financing scheme (Yescombe, 2011).

Studies conducted in Latin America suggest that a major challenge confronting the implementation of PPP policy in the delivery of public services has to do with the procurement and contract management processes in all the concessions granted. It was noted that renegotiations between governments and private firms occurred for about two and half years (Austin and Seitanidi, 2012). Again, it was noted that all the renegotiations were done along the lines of porous tender processes, weak regulations and opportunism from either the government or the private sector. This caused increased tariffs, and delayed investment opportunities preventing effective costs to be passed to the government (Clarke and Fuller, 2010; Brinkerhoff and Brinkerhoff, 2011; Austin and Seitanidi, 2012).

Moreover, efficient management of PPP transactions is required to start the process. There needs to be a continuous level of commitment and improved capacity of governments and private sector players to ensure PPPs achieve sustainable growth over time. PPPs turn to fail when government priorities change or there exist continuous external pressures as in the case of PPPs in Buenos Aires, Argentina. In sum, poor planning and project execution, limited financial resources, weak maintenance systems, and weak managerial capacity have been identified to be some of the challenging issues of PPPs (Asare and Frimpong, 2013).

2.11 Waste Generation and Management in Ghana

The population of Ghana was estimated to be around 23,000,000 as of 2010 (GSS, 2014). Out of the total population, 19% lived in the five largest cities that comprise Accra, Kumasi, Cape Coast, Sekondi-Takoradi and Tema. In terms of waste generation capacity, these cities generated about 3200 tonnes of solid waste daily and about 1.17 million tonnes of waste annually (Owusu-Sekyere et al., 2013). There are also other urban areas facing similar

challenges as the aforementioned cities, creating about 5000 tonnes of solid waste daily and 1.83 million tonnes of solid waste yearly (Government of Ghana, 2010). All these can be attributed to the increasing population and urbanisation. With continuous growth in the country's population and with its associated urban growth, industrial production, consumption of goods and services and change in lifestyles, the inevitable outcome will be an increase in waste generation (Owusu-Sekyere et al., 2013).

2.11.1 Means of Solid Waste Disposal

As per the 2010 Housing and Population Census, the method adopted by households in disposing-off waste was dumping refuse in open spaces, and this was practised by 37.7% of Ghanaian households. This is followed by the use of skip container which also makes up 23.8% of the means through which Ghanaian households dispose of their waste. House-to-house solid waste collection is the third in line with about 14.4% of households involved. Ghanaians who resorted to other methods of waste disposal such as burning accounted for 10.7% while 9.1% of them resorted to dumping disposal in unapproved places like drains, rivers, lakes, wetlands, etc. across the country. Households adopting burying (3.3%) as a means to dispose of waste are slightly two times less than those engaged in waste disposal in unapproved locations. One percent (1.0%) of households in Ghana adopted other means of clearing the waste they produce (GSS, 2014).

Based on the above narrations, it is clear that 46.8% of the population engages in improper practices in managing their solid waste since the receptacles for solid waste are often in open spaces and unapproved locations such as drains, rivers, streams, wetlands, etc. These waste disposal practices conflict with and are mostly in contravention of existing by-laws enacted by the local authorities (Oppong, 2016). They also have environmental and public health

implications. The problem has been the inadequate financial, material, and human resources at the disposal of local authorities to assist them in their effort in providing public education on proper disposal of waste in managing solid waste to ensure sanitation and the general public health of Ghanaians and the ecosystem (Government of Ghana, 2010).

2.11.2 Solid Waste Collection Capacity of Metropolitan, Municipal and District Assemblies (MMDAs)

At the local level, MMDAs are the sole institutions with the mandate in ensuring that solid waste is managed sustainably at manage in Ghana. Their capacity to manage solid waste can be measured or appraised based on daily collection ability within their jurisdictions. According to Owusu-Sekyere et al. (2013), with regard to the daily collection capacity of city authorities to manage waste, Kumasi emerged first as it was able to collect 85% of the total 1321 tons of waste generated daily. Owusu-Sekyere et al. (2013) further noted that Sekondi-Takoradi comes after Kumasi in terms of waste collection, as city authorities are able to collect 80% of the solid waste in their jurisdiction each day. Accra, which is the capital and no doubt warrant effective solid waste management was placed third as 75% of their solid waste received evacuation service daily (Owusu-Sekyere et al., 2013).

From these figures, an inference can be made that MMDAs are striving for waste collection because all the MMDAs manage to collect the majority of the solid waste generated within their respective jurisdictions. However, this is not effective because the remaining uncollected wastes range from 15% to 35% among the five cities, which can pose a threat of all forms to the environment and society as a whole. These figures infer that there is still a lot to be done to devise feasible and collaborative strategies, plans, policies and programmes with related stakeholders to help reduce waste generation to enhance the collection capacity of MMDAs (Owusu-Sekyere et al., 2013).

2.11.3 Waste Collection Methods in Ghana

Waste collection is the evacuation of solid waste from the source of generation that includes; residential, industrial, commercial, institutional facilities, etc. to the place of treatment or disposal. The term collection remains undone when only the collection of solid waste from various sources is carried out without further transporting the collected waste to the point where the collection vehicles have all their contents discharged (Tchobanoglous et al., 2003). Several methods are adopted to collect waste from points of waste production. They include:

House-to-House collection: With this solid waste collection, waste collectors visit houses to collect garbage for disposal. Usually, users are charged some amount of fee for this kind of service rendered to them (Oteng-Ababio, 2014).

Community Bin: This collection method is only possible with the availability of large community skip containers sitting at a fixed place in the vicinity. Users bring their garbage from various homes within the neighbourhood to dispose of their refuse in them. For further transportation of waste, municipalities and contracted waste collectors are entrusted with this responsibility as per a planned schedule (Oteng-Ababio, 2014).

Curbside Pick-Up: Users allow their garbage bins or solid waste receptacle to sit directly outside their abodes on the word of a waste pick-up plan by MMDAs. With curbside pick-up, the collector is charged with the responsibility of moving the containers or receptacles from the storage points to the collection vehicle (Tchobanoglous et al., 2003).

Self-Delivered: Sometimes where it is within the means of waste generators, they deliver their waste directly to disposal sites, transfer stations, or even hire third-party operators (Tchobanoglous et al., 2003).

Contracted or Delegated Service: Municipalities hire the services of waste collection companies who arrange collection schedules and charges with customers even though supervised and regulated by the local authority. Private waste companies are often mandated to ensure the effectiveness of waste collection in their respective zones (Oteng-Ababio, 2014).

2.12 Challenges in Waste Management in Ghana

Waste management services are said to be one of the important services central government and city authorities are required to provide for their people. The manner that waste is managed has a direct impact on human health and social well-being, as such, it is a quality of life issue. Many governments and city authorities are striving and endeavouring to manage solid waste, however, there are many constraints they face in managing solid waste collection and disposal (Owusu-Sekyere, 2014). A number of these challenges are as follows;

2.12.1 Negative attitude and behaviour of citizens

Meaningful and substantial progress in managing solid waste relies largely on the behaviours and attitudes of people towards public health and environmental sanitation. How the public handles and disposes of waste can predispose the general public to an environmental health crisis. For instance, littering and disposal of refuse in unapproved areas can increase ill health and the social well-being of people (Owusu, 2010). Generally, the perception of waste differs from one person to another. Uncollected heap of waste on the street to the public poses a great

danger to human health and the environment. Nevertheless, minor and major waste collectors would view it as a means of making money by rendering services. Sometimes our attitude towards waste generation is affected by our values and norms (Moore, 2012).

2.12.2 Lack of education and awareness

Some people's actions affect another person's actions positively as far as waste management is concerned. Lack of education and low level of awareness leads to poor adherence to good waste management practices. People litter around because of lack of education and awareness of pro-environmental practices like the 3Rs (reduce, reuse and recycle) and the separation of waste at source into recycling bins (Oteng-Ababio, 2011). In some other instances as well, the participation level of people in their attempt to manage waste is low because of financial reasons even though they have knowledge of the best waste management practices. The above issues raise the need for effective education and participatory waste management mechanisms that will lead to a positive attitude and consequently stir the interest of a person to follow proper solid waste management practices (Oteng-Ababio, 2011).

2.12.3 Inadequate funds and logistics

Budgetary constraints render municipalities financially incapable of executing solid waste management strategies. Because of this, municipalities are compelled to select areas where they are capable of meeting the coverage of service. These constraints have also led to municipalities striving to achieve the required and acceptable quality, coverage and targets to reduce poor waste management. This constraint also makes it difficult to assess whether they are performing as intended or lagging behind sustainable solid waste management progress. Government of Ghana (2010) listed inadequate waste collection vehicles as one of the most unyielding challenges in solid waste management facing municipalities in Ghana. Hazra and

Goel (2009) asserted that another reason that allows residents to dispose of solid waste indiscriminately was that waste containers were in bad conditions and mostly insufficiently maintained and or replaced broken down collection vehicles.

2.12.4 Inadequate landfill disposal sites

In Ghana lack of proper disposal sites is a major shortfall in managing solid waste (Oduro-Kwarteng and Dijk, 2013). The country has only two engineered landfill sites, with one being in Accra and the other in Kumasi. However, many countries have employed recycling as a waste management tool because of rapid urbanisation and population growth which is leading to the full-up of landfill sites. This situation if not addressed timeously and comprehensively often leads to health and environmental risk for the populace, especially those living in communities close by. Considering an alternative to relocating landfill sites also can create financial burdens on municipalities to embark on that journey they intend to provide healthy means of disposing of solid waste (Oteng-Ababio et al., 2012).

2.12.5 Lack of policy enforcement and regulation

Many developing countries even if endowed with various resources like funds, logistics, landfill sites etc. that help address solid waste management challenges may have challenges managing waste if enforcement of regulation and policies are weak (Hazra and Goel, 2009). Weaknesses in the enforcement and operationalization of policy and laws aimed at ensuring proper management of waste may give way to improper means of handling and disposing of solid waste, which when pervasive can have a consequential environmental health impact on the society (Hazra and Goel, 2009). For example, some time ago Nigeria embarked on an environmental clean-up exercise where all citizens were mandated to undertake the exercise every month just as Ghana is operationalizing currently, the first Saturday of every month. The

exercise phased out gradually and quickly because of poor management and lack of law or policy enforcement. People reverted to their negative conventional means of disposing of waste along roads and in the outskirts of the town where the poor domicile.

2.13 Theoretical Overview and Conceptual Framework

The management of waste is a complex undertaking that requires appropriate policies, structured organizations and the required stakeholder engagement (Boateng et al., 2016). A multi-sectoral approach is needed for the sustainable management of solid waste through the application of interdisciplinary expertise (Seadon, 2010). Within the complex nature of solid waste management, there are many dimensions such as urbanization, land use, public policy, social organization and governance (Oteng-Ababio, 2013). The interactions among the varied and complex components of waste management require the subject matter to be viewed from a holistic perspective. When waste management is viewed as part of a system, approached and studied holistically will review the important aspect that will lend itself to deeper understanding (Zarate et al., 2008). Understanding the interrelated and interconnected nature of the various components will review patterns that may not be possible if they are researched independently. Within this study, the conceptual application of a systems approach is to recognise the complexity required in private sector participation in sustainable solid waste management.

Sustainable waste management research takes a conventional approach of isolating various parts of the complex system and applying theoretical approaches to understanding the subject (Marshal, 2013). Such an approach though has been widely used and has yielded many findings and conclusions does not treat the interlinkages among all the complex components which are part of the system (Seadon, 2010).

Theoretically, the study is operationalized by understanding the relationship between rapid urbanization, the policy environment for waste management, private sector participation and how they interact at a municipal level to achieve sustainable waste management. On their own accord, the concept of urbanization, public policy and private sector participation in public utilities present formidable research difficulties. A unifying theoretical approach will provide the most appropriate way of understanding the complexities and interlinkages of sustainable waste management at a decentralized level. To account for the varied nature of variables at play in sustainable waste management, the systems approach is adopted as the theoretical underpinning in this study.

2.13.1 Systems Theory Approach

Systems Theory Approach (STA) is an explanatory framework that is used to study and comprehend how constituent parts of an object behave. The usefulness of a systems approach is based on the notion that it can be applied to studies aimed at understanding the sustainability of an organization or a structure and its operations (Pfeffer and Salancik (1978). According to Shankar, 2017, systems thinking is an attempt to escape the reductionism of normal science. A unified approach to the study of phenomena is an important aspect of systems theory. (Asase et al., 2009). Fobil et al. (2008) describe the core systems image as that of the whole entity which can adapt and survive in a changing environment. The value of the systems approach is the ability to consider the function and meaning of the whole as well as the parts. When taken apart, the essence of the system and its parts are lost.

Private sector participation in sustainable solid waste management which is seen as a complex system function holistically and therefore, when studied using the systems theory approach (STA) will lead to a deeper understanding of the subject area (Marshall et al., 2013). Within

the systems approach to research, there is a focus on the relationships among the elements that make up the subsystems.

Additionally, the patterns produced by the relationships and the processes that shape them as well as their environmental context are intrinsic parts of the systems approach. (Ameyaw et al., 2015). Within the system approach, there are three levels considered, these include the system, subsystems and elements. According to Patton (2002) cited in Marshall, R. (2013) P. 43, “(1) a systems perspective is becoming increasingly important in dealing with and understanding real-world complexities, viewing things as whole entities embedded in context and still larger wholes; (2) some approaches to systems research lead directly to and depend heavily on inquiry; and (3) a systems orientation can be very helpful in framing questions and, later, making sense out of data”.

Within the field of private sector participation in sustainable solid waste management, there is an intrinsic need for a systems approach and integrated methodologies. Given this background, there are gaps in the actual application of the systems theory to private sector participation in sustainable solid waste management within the context of decentralized governance (Kubanza et al., 2018). Even though the systems theory approach may not be the “a silver bullet” to sustainable management research, it can serve the purpose of treating the complexities in sustainable waste management research while taking account of the specific context and the elements. (Waltner-Toews et al., 2008) Effective sustainable waste management research will benefit from a contextual treatment that the STA enables. (Kubanza et al., 2018).

Systems are made up of interrelated elements which form a whole and have relationships. The key aspects of a system are the interconnection between the elements which form the relationships. The elements may form sub systems which may be connected to other sub systems or elements (Marshall et al., 2013). The function of a relationships within a system creates the

interaction required for the elements to become whole. Systems have boundaries that separate their interlinked elements from external environments. (Ackof, 1971).

To conceptualize Private sector participation in sustainable solid waste management in this study as a complex system, the subsystems and elements can be isolated, their relationships mapped and their boundaries identified. The following are some of the subsystems that are identified with Private sector participation in sustainable solid waste management within the context of this study; urbanisation, public policy, governance, solid waste management operations and private sector participation. Within these subsystems, the following elements could be identified; service standards, financial responsibilities, human resource capacity, household waste generation and waste management equipment. These elements and subsystems interact in complex loops to produce the overall goal of the sustainable waste management system. Taking individually, the elements could be studied in detail to gain an understanding of their contribution to sustainable waste management, however, such a reductionist approach may miss the interlinkages afforded by a unified approach. This is why the systems theory approach is used as the theoretical underpinning of the study. This is to allow us understand the complexity as well as the relationships of the subject.

2.14 Conceptual framework

The conceptual framework mainly draws the connection between issues or concepts discussed in the study and maps out the necessary actions required in the course of the study with regard to previous knowledge gathered from other researchers (Schluep, 2010). First, the problem of waste management is conceptualised as a problem closely associated with the poor management of urban growth and increased consumption which is ineluctably linked with urbanization resulting in high and increasing urban waste generation. This issue is reminiscent

of the urban development trajectory in most developing countries (Daramola et. al, 2010). In dealing with MSW more sustainably, the study conceptualises that private sector participation is instrumental in this regard. As has been indicated in the review, its instrumentality lies in the efficiency, effectiveness and improvement in the service that they are likely to bring to bear, as expected from private sector businesses. However, these outputs as expected from the private sector are contingent on the environment that is created for them to operate. Findings from the literature reviewed conceptualised three main issues that are important in the creation of an enabling environment. These are first, regulatory frameworks and policies from the local and central government that guide the roles of the stakeholders involved in waste management, secondly, meeting financial obligation on the part of the local government and residents and thirdly, human resources and technical capacity of the local government to monitor private sector actors and also play an oversight role in the implementation of the laid down regulation and policies.

If the arrangement specified in the regulation, policies and contracts entered into are adhered to, will help achieve sustainable municipal solid waste management. The outcome would be an improved environmental situation in the local area or municipality. This will also lead to an improved health situation since this will reduce the vulnerabilities to environmental health-related diseases. Private sector actors, a better work environment and profitability for the private sector will lead to business expansion which will lead to employment opportunities for people in this area of private sector. It is important to indicate that business viability also depends largely on how local authorities are able to pay for services rendered by private waste business operators at regular intervals. When all actors are able to discharge their responsibilities, it is conceptualised that the lessons learnt and the experience gained from the process will further enhance the regulatory framework and regime, perhaps inculcation of new

areas that may have to be improved further in the legislation and/or policy. Further, the learning process will enhance the capacity of personnel in charge of waste management monitoring in the local government which will enhance technical and managerial capacity critical in enhancing the enabling environment for private sector development.

In relating the conceptual framework to the theory, it can be argued that waste management is a system with different components. There is the generation, collection, storage, disposal and if moved further treatment and recycling. But as a system, it needs resources (financial and technical) to enable these parts of the system work effectively and efficiently. It is in this regard that the private sector comes in, and may be seen to be kin to what Bertalanffy (1951) describes as resources from without. These additional resources are critical for maintaining the sustainability of the system or homeostasis. Further, the regulatory environment also forms an important component of the whole system and if it is functioning properly it can help sustain the waste management system. Figure 2.1 shows the conceptual framework of the study.

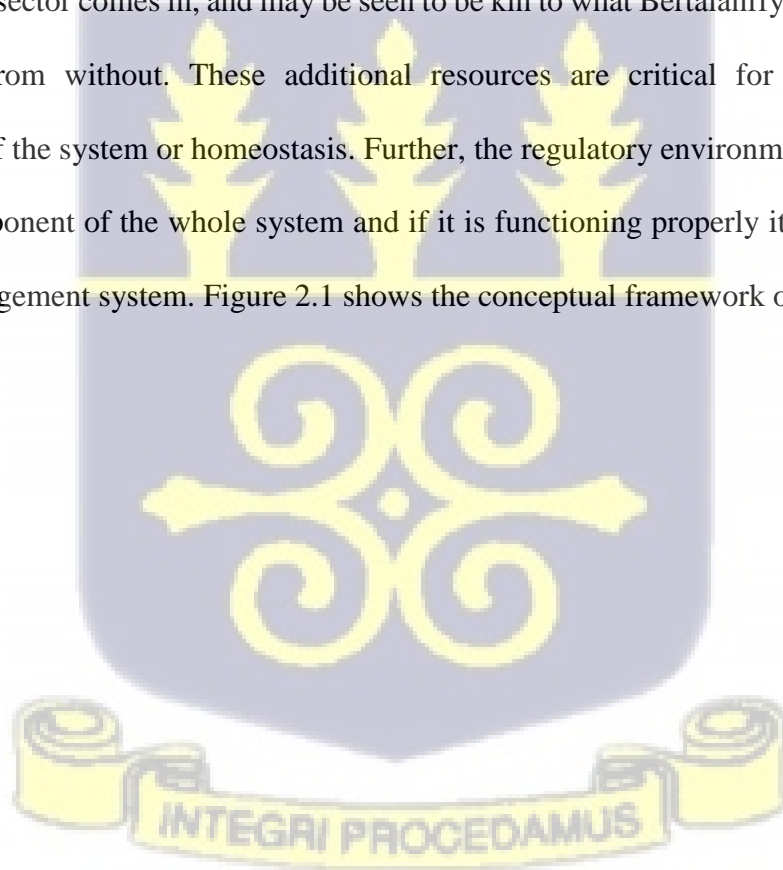
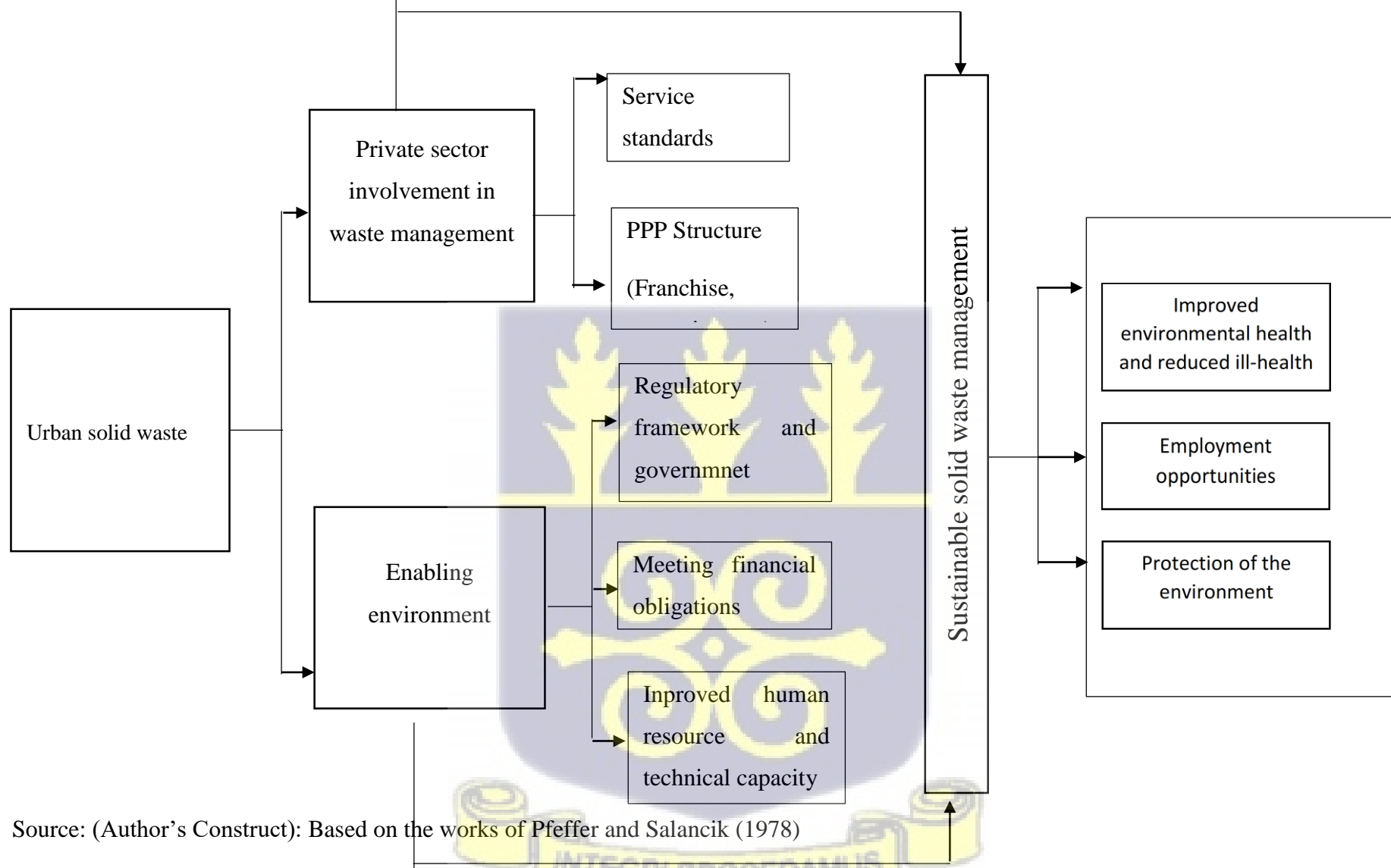


Figure 2.1: Waste management as a system: A conceptual framework



Source: (Author's Construct): Based on the works of Pfeffer and Salancik (1978)

2.15 Chapter Summary

The issues discussed in this chapter reviewed relevant literature on some basic concepts relating to solid waste globally with specific highlighting on Ghana that aided in the understanding of the research objectives. The issues discussed include; the prospects and challenges in the involvement of the private sector and how their efforts can be complemented in ensuring sustainable waste management which are the main issues of concern. The conceptual framework guiding the study was also developed in this chapter. Having obtained information from the literature and the various concepts, the next stage of this study is the collection of data from the study area which is the La Nkwantanang-Madina Municipality. This will be discussed in detail in chapter three of this thesis.



CHAPTER THREE

PROFILE OF STUDY AREA AND METHODOLOGY

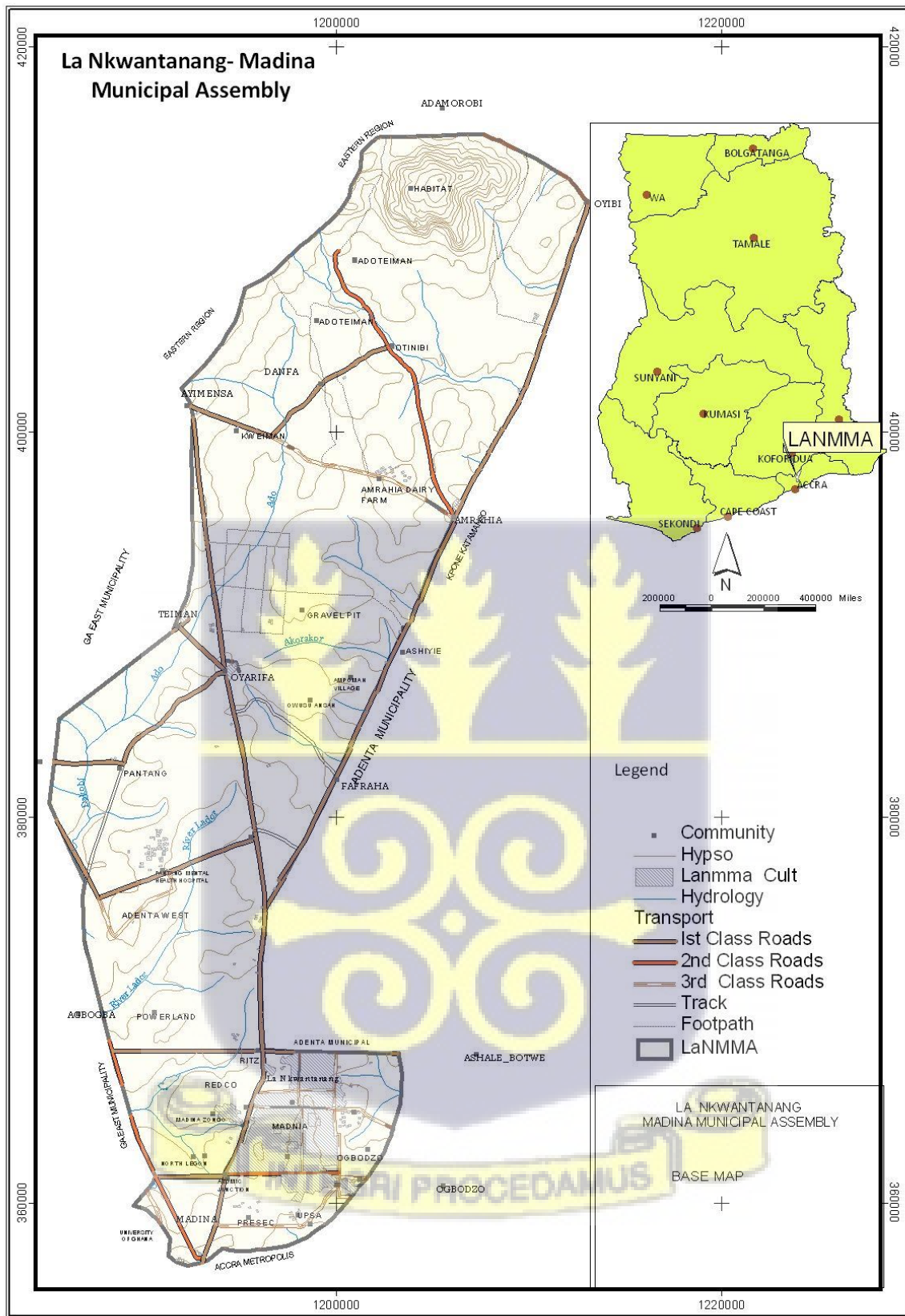
3.1 Introduction

There are two main parts in this chapter; The first section presents the profile of the study. It also covers issues such as population size and growth rates, location and land size, the conditions of the built environment and the solid waste management situations in the study area. Part two of this chapter covers the methodology used in the study with emphasis on the research design and approach, determination of sample size, data sources, collection, analysis and validity of the data. Issues discussed also include ethical considerations and how they were applied in the study.

3.2 Profile of the Study Area

The La Nkwantatnang-Madina Municipal Assembly (LaNMMA) was established on 28th June 2012 by an LI 2131. The Assembly was separated from the Ga East Municipal Assembly. Its capital is located at Madina, a busy commercial and residential hub. It is located in the northern part of the Greater Accra Region (LaNMMA, 2018), It is situated between Latitude 5^o 81'3" N and Latitude 5^o 67'7" N, between Longitude 0^o 24'0" W and 0^o 13'1" W. It is one of the sixteen districts in the Greater Accra Region and covers a total land area of 74.4 square kilometres. It is bounded on the West by the Ga East Municipal, and on the East by the Adentan Municipal. The southern portion is bounded by the Accra Metropolitan Assembly whilst the North-West and North-East are bounded by the Akwapim South and Kpone-Katamanso Districts respectively (GSS, 2014). The study area is shown in Figure 3.1

Figure 3.1 Map of La Nkwantanang-Madina Municipality



Source: LaNMMA, 2018

The entire Municipality is a low-lying area boarded in the northern part by a section of the Akwapim range and traversed by river streams such as the Sismi and Dakubi rivers. The area ranges between 375-428m south of Aburi and falls to 300m southwards. Some of the low line areas are mush lands (GSS, 2014).

According to the 2010 Population and Housing Census (PHC), the total population of the municipality stood at 111,926 and with an inter-censal growth of 3.2%. It is estimated to be 146,913 in 2018. The majority of the population in the municipality were females constituting 51.5% as against the males who make up 48.5%. About 51.6% of the population in LaNMMA is under the age of 25 years. Indeed 85.5 % of the structure of the Municipality's population is under the age of 40 years according to figures from the PHC 2010. The population structure of the Municipality reveals a great number of youth over the aged and females over males. There is a low dependency ratio as the majority (71.3%) of the municipality population falls within the economically active age group (15-64 years).

The average household size of the district is 3.9 (2010 PHC) indicating an increase over the 2000 Census figure. This shows that there has been a significant reduction in household size. The housing stock of the municipality is estimated to be 13,647 (2010 PHC). The various housing characteristics are shown in Table 3.1

Table 3.1 Housing Characteristics

Description	Characteristics
No. of Houses	13,647
No. of Households (HH)	108,051
Household Size	3.9
Head of Households (%)	66.1% (Male) 33.9% (Female)

Source: 2010 PHC

3.3 District Economy

As a predominantly urban area, the economy of the municipality is dominated by trading and commerce where most of the trading entities are small-scale informal establishments. The predominance of commerce and trading reflects in the structure of employment as demonstrated by the data from the 2010 census where 69.7% are engaged in the private informal sector. Other important sectors of the municipal economy include the manufacturing industries such as Nkulenu, Special ice Water Company, and Voltic Water Bottling Company, among others employing about 29.2% of the working population. About 2.4% of the working population are however into agriculture, forestry and fishing. The trading and commerce activities are concentrated in the Central Business District and within the market and have become hotspots for the generation of waste within the municipality. A lot of commerce and trading activities also take place in open spaces and along major roads. Attached to many of the commercial areas are transport terminals where goods and passengers are moved. These economic activities are also responsible for the generation of waste.

3.4 Solid Waste Management

Indeed, La Nkwantanang-Madina Municipality has witnessed increased growth in the population over the years which has had a significant impact on waste generation. This problem is compounded by rapid urbanisation spurred by internal growth and migration in a seriously constrained built environment (Gould et al, 2003). La Nkwantanang-Madina Municipality is mainly an urban area dominated by residential, industrial and commercial activities that lead to the generation of waste in large quantities. Between 2000 and 2010 the amount of waste generated in the La Nkwantanang-Madina Municipality increased from 0.45kg per head per day to 0.80kg per head per day (World Bank, 2010). According to the 2010 PHC, the main methods for disposal of waste by households in the municipality are through household

collections by franchise companies, dumping in approved public skips, dumping in unapproved places, burring and burning. Based on figures from the 2010 census, household waste collection by the private sector constituted 67.9% with the use of public dumps (containers) constituting 12.1% as the second-highest method of household solid waste disposal. Though there is an insignificant percentage of 1.1 households dumping indiscriminately, this practice is most common in rural areas compared to urban centres with a percentage of 3.2 against 0.7 respectively. The municipality is zoned into eight areas with a particular private waste company assigned to each.

3.5 Methodology

3.5.1 Research Philosophy

There is always a philosophical assumption supporting how a study is undertaken. The role of philosophy in research has grown to be essential. The philosophical perspective that underpins research emphasises the direction and broad concepts of how a researcher views the world (Creswell, 2009). The design of the study and the methods used to probe further into the subject under investigation are all governed by this worldview.

This study adopts the pragmatist philosophy. Pragmatism as a research paradigm finds its philosophical foundation in the historical contributions of the philosophy of pragmatism (Maxcy 2003) and, as such, embraces a plurality of methods. As a research paradigm, pragmatism is based on the proposition that researchers should use the philosophical and/or methodological approach that works best for the particular research problem that is being investigated (Tashakkori and Teddlie 1998). The pragmatics aligns themselves with the mixed method strategy to research as it involves both qualitative and quantitative approaches to study (Biesta 2010; Johnson and Onwuegbuzie 2004; Tashakkori and Teddlie 2009). Considering

that the world consists of social, natural, historical, and cultural elements, pragmatics disregards the idea that the world is an immutable entity (Morgan, 2007). As a result, the researcher has a wider range of options to choose from when selecting the methods, techniques, and procedures to use when examining an issue (Creswell, 2009). Therefore, pragmatism provides the opportunity for researchers to examine all facets of a problem for a holistic understanding rather than concentrating on methodologies and approaches (Creswell, 2009). Therefore, it is acknowledged as providing the philosophical foundation for mixed-method research (Morgan, 2007).

The current research seeks to assess the enabling environment for private sector participation in the management of solid waste. This study takes into consideration the dynamic nature of partnership between service providers and the Municipal Assembly including human capital, experience, skills required and regulatory framework. To better comprehend the role played by private sector entities in the sustainable management of waste and to explore the existing conditions under which they perform this role will require quantifiable techniques and an in-depth understanding of people's experiences, actions and culture. Adopting any other worldview philosophy to this study will limit the holistic understanding of the problem investigated. Pragmatism as a philosophical worldview offers a better platform as it allows for the use of mixed method techniques and procedures coupled with specific theories and frameworks to unravel the complex problem investigated (Ivankova, 2006).

3.5.2 Research Design

The study employed the descriptive case study design. According to Yin (2003), this strategy offers an all-encompassing method for systematically studying and describing a phenomenon within a factual context. Thus, a case study can investigate the dynamics and interrelationships

among phenomena such as people, policies, and decisions among others (Simon et al., 1996.) A descriptive case study also successfully provides multiple sources of qualitative and quantitative evidence for triangulating such experiential data in an all-encompassing manner (Yin, 2003). Thomas (2011) noted that a case study provides an in-depth understanding of a process, event, or phenomenon, using a range of data collection procedures. The design provides an empirical framework for collecting, analyzing, and triangulating multiple sources of quantitative and qualitative evidence, including documents, interviews, observations, and surveys (Yin, 2003).

Notwithstanding its strength to provide a profound understanding of research by combining varying data sources, a case study has also been criticized for its lack of representativeness and limited generalizability (Creswell, 2011). The case study, however, offers the best design for this study to examine the enabling environment for private sector participation in the management of solid waste in the La Nkwantanang-Madina Municipality as it offers explanations for the 'how' and 'why' questions addressed in the study. Further, the case study helped to explore in-depth the current policy arrangement guiding waste management operations and the challenges associated with solid waste management in the La Nkwantanang-Madina Municipality. Instead of using separate methodologies for data gathering and analysis as in traditional mixed-methods research, the case study method offers an integrated, structured approach for a more holistic, detailed, intensive analysis and descriptive result to understand the enabling environment that the government has provided for the private sector to actively participate in waste management in the La Nkwantanang-Madina Municipality.

3.5.3 Research Approach

Considering the diverse nature of the data required and the different sources from which they had to be gathered made it appropriate to adopt the mixed methods approach. The application of this approach according to Creswell (2014), the research is able to draw on the complementarity of both the specific and holistic aspects of the study. The study benefited from integrated and balanced research through the application of the mixed method approach. The data collection tool used was a combination of qualitative and quantitative approaches. This included questionnaires, in-depth interviews, and direct observations. According to Yilmaz (2013), this allowed the researcher to gain not just an in-depth understanding but also get to know current trends with regard to the subject matter being investigated. Thus, the use of the mixed method in this study is justified on the grounds that it enabled the researcher explore the research questions from different perspectives which leads to a broader understanding of the issues connected with sustainable solid waste management in Ghanaian cities.

3.5.4 Study Population

The study population is the broad list of respondents or units from which the study is conducted (Huber et al.,2016). The population is also called the unit of enquiry (Rahi, 2017). It is from this large population that the sample frame and size are determined. For some studies, the study population may be the same as the sample frame and for others, the population may be the same as the sample size. For this study, the target population from which the sample population was drawn included the Staff of the La Nkwantanang-Madina Municipal Assembly, Staff of private waste management firms operating in the municipality, and households of La Nkwantanang-Madina Municipality. In sanitation and hygiene research, households should be

regarded as the target population since they combine both internal and external aspects relevant to health and sanitation, according to Berman et al. (1994).

3.5.5 Sample Size and Sampling Techniques

Myers et al. (2013) define sample size as a count of individual samples or observations in any statistical setting, such as a scientific experiment or a public opinion survey. Though relatively straightforward, the choice of sample size is a critical determination for a project (Sharma, 2017). Sampling on the other hand is a technique for selecting individual members or a subset of the population to make reasonable statistical inferences from them and estimate the characteristics of the whole population. (Driscoll, 2011). It is necessary because time and resource constraints do not allow a researcher to investigate the entire population (Rea and Parker (2014).

Multistage sampling was used in the selection of the study areas. According to Acharya et al. (2013), multistage sampling, also known as multistage cluster sampling, involves taking a sample from a population in stages using smaller groupings or units. It is usually used to gather information in surveys involving a broad geographically dispersed population. Stratified sampling was used in the first stage to divide the municipality into three income groups (low-income, middle-income, and high-income) per the income classification by the La Nkwantanang- Madina Municipal Assembly. Stratified sampling is where the population is divided into subgroups and a random sample is taken from each subgroup (Creswell, 2009). Where there is a considerable variance within a population, stratified sampling is usually utilized (Singh and Masuku, 2014). It aims to ensure that each subgroup is fairly represented.

This method is ideal for this study since it guarantees that the relevant subgroup is represented in the sample.

Simple random sampling was then used to select the study communities from each income group. This sampling technique ensured that each element of the population has an equal chance of being selected in the sample (West, 2016). Six communities were randomly selected, two communities from each of the three classifications. They include Pantang and North Legon representing the high-income areas, Madina Zongo and Oyarifa representing the middle-income areas, and Danfa and Ayimensa representing the low-income areas (See Table 3.2).

The sample size for the study was determined using the household population data for the municipality from the 2010 population and housing census. According to Ghana Statistical Service (2010), the Municipality has a household population of 28,699. The sample size was determined using Yamane's formula (Gomez and Jones, 2010) for sample size determination as follows;

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the total number of households in the six selected communities (2,041) and e is the margin of error (0.07). This method was used because it helps in getting an accurate sample size for the study. The sample size obtained for the study was two hundred and four (204). However, due to the unwillingness of households to participate in the survey, a total of one hundred and eighty-six hundred households (186) responses were obtained. Representing a response rate of 91%. The sample size was distributed among the six communities using proportionate sampling for a fair representation as presented in Table 3.2.

Table 3.2 Residential Categories and determination of sample size for study communities

Socio-economic Classifications	Communities	No. of Households	Calculated sample size
High-income areas	Pantang	189	17
	North Legon	197	18
Middle-income areas	Oyarifa	495	45
	Madina Zongo	784	72
Low-income areas	Danfa	244	27
	Ayimensah	132	12
Total		2,041	186

Source: Authors construct

A random sampling technique was used in selecting respondents for the households from the six selected communities where every 3rd household was selected. This is to provide wide geographical coverage of respondents in the communities. For houses that had more than one household, the researcher selected one household randomly. However, convenient sampling was employed to select the household in situations where some households were not willing to participate in the study. The questionnaire administration was aimed at the heads of the selected households. However, in their absence, any adults 18 years of age and older were interviewed.

Purposive sampling was also used to obtain data from specific groups based on their roles in solid waste management in the study area. Purposive or judgmental sampling is a strategy in which particular settings, persons, or events are selected deliberately to provide important information that cannot be obtained from other choices (Moser and Korstjens, 2018). Eight (8) key informants were selected for interviews, these include the Municipal Environmental Health Officer, Municipal Planning Officer, three (3) Assembly members and three (3) Private Waste

Contractors from the three income groups (low-income, middle-income, and high-income) per the income classification by the La Nkwantanang- Madina Municipal Assembly.

3.5.6 Sources of Data

Data for this study were obtained from two main sources, thus primary and secondary. This helped to obtain relevant information that helped to address the objectives of the study.

3.5.6.1 Secondary Data

Secondary data is an important source of data for research. It refers to second-hand data retrieved from other studies (Vartanian, 2010). Secondary data were gathered from a critical literature review of scholarly articles, journals, books, and published and unpublished materials on solid waste management and from government and private institutions such as the La Nkwantanang-Madina Municipal Assembly, the Environmental Health Office/Waste Management Department, private waste management companies, among others. The secondary data reviewed include demographic data which helped in the determination of the sampling size, volumes and types of waste generated, stakeholders and their roles in solid waste management, challenges associated with solid waste management and private sector participation, among others. This provided an idea of the direction and depth of work that has been undertaken on sanitation services delivery, ensuring that the research experiences and outcomes on private sector involvement in solid waste management are logically explained, and enabled the researcher to identify further research requirements.

3.5.6.2 Primary Data

Primary data refers to data gathered by the researcher directly from the field (Creswell, 2003). Both qualitative and quantitative research methods were used in the collection of primary data. These included interviews, the administration of questionnaires, and personal observation. The collection was dependent on the required data for each research tool used.

3.5.7 Data Collection

Considering the nature of the respondents for this study, a set of questionnaires was designed to collect primary data from the respondents selected from the six communities. These instruments were designed and used to collect primary data from the household in the municipality, officials of La Nkwantanang-Madina Municipal Assembly, Assembly members and private waste management companies. The details of each of the instruments are described in subsections 3.7.5.1 and 3.7.5.2.

3.5.7.1 Questionnaires

A questionnaire is a research tool that consists of questions designed by a researcher to collect responses or opinions from respondents (Krosnick, 2018). The instrument was designed in such a way that, it contained both closed-ended and opened-ended questions. Open-ended questions allow respondents to freely express their subjective thoughts about issues without being restricted to choosing from a list of options or predefined response categories (Popping, 2015). As a result, a free text field was included in the questionnaire so that respondents could explain their choices more fully. Conversely, respondents are given a choice between a limited number of alternatives or fundamental answer categories in closed-ended questions (Martino et al., 2017). This offers a simple framework for analysing respondents' responses. The questions raised in the instruments were based on the demographic characteristics of respondents, the waste management policy of Ghana, the effects of enabling environment, waste management practices, and challenges associated with creating enabling environment.

3.5.7.2 Interview Guide

An interview is a conversation used to acquire data (Jong and Jung, 2015). An interview is a good approach that helps researchers to gather in-depth attitudes, beliefs, and structures or policies from individuals in charge of certain subjects or endowed with some type of expertise (Creswell, 2003). A research interview involves both the researcher who guides the conversation and poses the questions and the respondent who provides answers. Semi-structured in-person interviews were conducted for this study. The interviews conducted covered all the salient issues leading to the attainment of the research objectives and addressing the research questions. Key informant interviews were conducted with the Municipal Environmental Health Officer (MEHO) and Municipal Planning Officer (MPO) of the Assembly, Managers of the private waste management firms, and Assembly members in the Municipality. The interviews were conducted one on one with the respondents with both an audio recorder and a notebook to record the conversation. Also, some interviews were conducted on phone due to challenges in getting some of the interviewees in person as a result of the Covid-19 pandemic.

3.5.7.3 Observation

Personal Observation was also employed in collecting data in the field. Tewksbury (2012) defines personal observation as the meticulous process of acquiring useful knowledge about individuals, groups, and objects through detailed peering and breaking down of behaviours and interactions. Wright and Irwin (2018) pointed out that a good method to identify behaviours is personal observation in the field. This was done to observe the sanitary environment of the municipality in terms of waste management and to identify appropriate times to administer

questionnaires to respondents as well as to cross-check key issues that unfolded in the literature review and during the survey

3.5.8 Data Analysis

The quantitative data collected through the administration of questionnaires were examined to check the completeness, accuracy and consistency of respondents in order to detect and eliminate errors. The Statistical Package for Social Scientists (SPSS) was used for data processing at the end of the data collection process since its application enhances the manipulation and easy use of the data to achieve the stated objectives of the study. Frequency tables were generated as well as Cross-tabulations made between relevant variables such as income levels and waste disposal method. Outputs derived from the SPSS were used to discuss the findings of the study.

Qualitative data in the form of audio recordings through interviews were transcribed from the audio recorder. The transcribed interviews were then thematically coded according to the study objectives. The results were presented as direct quotations in Chapter four of the study which revealed several findings towards the achievement of the research questions and objectives.

3.6 Ethical Considerations

Bell and Waters (2018), argue that it is ethical for researchers to solicit the consent of respondents before embarking on data gathering activity. It is also important to acknowledge that research could have certain intrusiveness which may make participants uncomfortable (Johnson, 2014). Therefore, researchers must consider the interest of participants by making

some ethical considerations. Ethical considerations represent researchers' attempts to show respect to the participants of the study and to protect the identities of respondents.

3.6.1 Access

An introductory letter was obtained from the Head of the Department of Geography and Resource Development, University of Ghana, Legon, to enable approval from gatekeepers and participants. Thus, a copy of the introductory letter was sent to the respondents to seek approval for data collection. After permission was granted at that level, dates, time and venues for data collection were fixed.

3.6.2 Informed Consent

Participants needed to be furnished with accurate and complete information on the goal(s) and procedures of the investigation so that they fully understand and in turn decide whether to participate or not (Bryman, 2008). This makes informed consent a necessary prerequisite to any research activity in which human beings are involved as participants. In this study, the researcher clearly spelt out the purpose, the intended use of the data and its significance to the participants. Each of the participants willingly decided to take part in the study

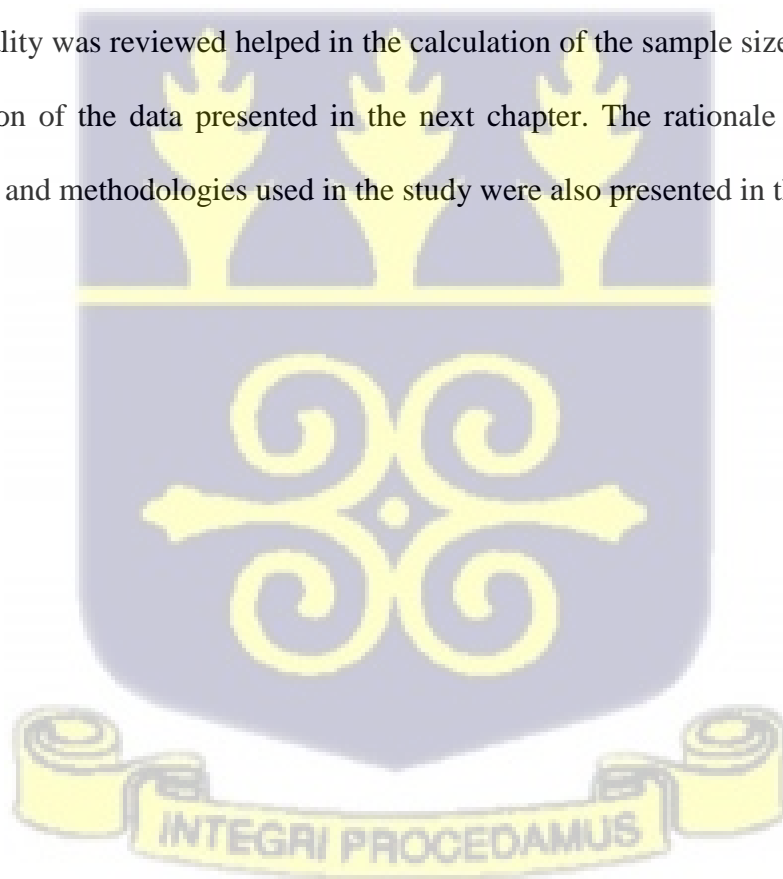
3.6.3 Confidentiality and Anonymity

During the data collection exercise, respondents were assured full confidentiality and anonymity regarding the responses provided and their personalities. They were assured that the information gathered will not be used for any other purpose aside from academic ones and that their identities shall always be hidden in the write-ups of the study or in any of the presentations meant to defend this study. Participants identified in the study were "masked" or "blinded" as far as possible. They were also made aware that people who read the published research and

the researcher would not be able to identify a given response by a given respondent. Participants were encouraged not to write any identifiable information (such as the name of the school, participants' name, email address, house number and contacts) on the questionnaires. Besides, codes were assigned to the questionnaires and interview data during the data analysis.

3.7 Chapter Summary

This chapter reviewed literature on the municipality to have a fair idea of what pertains to the municipality. Some of the issues looked at were the demographic characteristics, economy and social characteristics of the district. With the demographic characteristics where the population of the municipality was reviewed helped in the calculation of the sample size which was used for the collection of the data presented in the next chapter. The rationale for selecting the research design and methodologies used in the study were also presented in this chapter



CHAPTER FOUR

PRESENTATION OF STUDY RESULTS

4.1 Introduction

This chapter presents the results of the study. Frequency tables and cross-tabulations were used to simplify the data gathered and discussed in the context of the study. The demographic background of the respondents is analysed first in this chapter. The chapter goes on to present the data gathered in reference to the research questions. A total of 186 questionnaires were completely filled out and used for the analysis. The questionnaire was completed by people in the La Nkwantanang-Madina Municipal Assembly, private waste management firms and residents of La Nkwantanang-Madina Municipality. Some of these institutions and resident households were sampled for the collection of the primary data. The population structure of the Municipality reveals a preponderance of youth over the aged and females over males. Furthermore, the results were organised based on respondents' geographic location which include two communities in each of the three area classifications (high-income areas-Pantang and North Legon; middle-income areas- Oyarifa and Madina Zongo; low-income areas-Danfa, and Ayimensah, according to the data.

The chapter is organised into two main parts. The first part deals with the demographic variables while the second part is devoted to responses given by the respondents in accordance with the specific objectives of the study.

4.2 Demographic characteristics of respondents

This section presents a description of the background of the respondents. The age and gender of respondents, level of education, average monthly income, and sectors of employment were presented using frequencies and percentages. These characteristics are given on community

basis. The summary of the demographic characteristics is provided in Tables 4.1, 4.2, 4.3 and 4.4.

4.2.1 Age of Respondents

Table 4.1 presents the ages of the respondent in the communities.

Table 4.1: Age of Respondents

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Below 25 years	0	0.0	8	44.4	4	8.9	1	1.4	5	22.7	1	8.3	19	10.2
26-30 years	7	41.2	2	11.1	4	8.9	7	9.7	5	22.7	4	33.3	29	15.6
31-40 years	5	29.4	4	22.2	22	48.9	30	41.7	0	0.0	2	16.7	63	33.9
Above 51 years	5	29.4	4	22.2	15	33.3	34	47.2	12	54.5	5	41.7	75	40.3
Total	17	100	18	100	45	100	72	100	22	100	12	100	186	100

Source: Field Data, 2021

The data shows that the respondents were predominantly above 51 years of age, representing 40.3% out of the total respondents sampled. Danfa, Madina, Ayimensah and Oyarifa constituting the majority of the numbers with 54.5%, 47.2%, 41.7% and 33.3% respectively. This was followed by respondents between the ages of 31 and 40 representing 33.9%. A total of 15.6% representing 29 respondents fell between 26 and 30 years. Lastly, 19 respondents representing 10.2% were below 25 years. The majority of respondents (41.2%) at North Legon were under the age of 25, implying that the majority of respondents found at North Legon were within the youthful age as compared to the other communities.



4.2.2 Sex and educational level of respondents

Table 4.2 presents the gender and educational levels of respondents.

Table 4.2: Sex of Respondents

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Female	12	70.6	8	44.4	27	60.0	61	84.7	15	68.2	9	75	132	71.0
Male	5	29.4	10	55.6	18	40.0	11	15.3	7	31.8	3	25	54	29.0
Total	17	100	18	100	45	100	72	100	22	100	12	100	186	100
Level of Education														
None	0	0.0	0	0.0	2	4.4	1	1.4	4	18.2	1	8.3	8	4.3
Primary	0	0.0	0	0.0	0	0.0	2	2.8	3	13.6	5	41.7	10	5.4
JHS/Middle	0	0.0	0	0.0	8	17.8	13	18.1	1	4.5	3	25.0	25	13.4
SHS	3	17.6	1	5.6	9	20.0	18	25.0	4	18.2	1	8.3	36	19.4
Voc/Tech	0	0.0	4	22.2	4	8.9	10	13.9	7	31.8	2	16.7	27	14.5
Tertiary	14	82.4	13	72.2	20	44.4	21	29.2	1	4.5	0	0.0	69	37.1
Non-formal	0	0.0	0	0.0	2	4.4	7	9.7	2	9.1	0	0.0	11	5.9
Total	17	100	18	100	45	100	72	100	22	100	12	100	186	100

Source: Field Data, 2021

The results on Table 4.2 indicates that the majority of the respondents in five of the communities were females (71%), and the remaining 29% are males with the exception of North Legon recording a slightly higher percentage (55.6%) of males over the female respondents. With regards to the educational level, though the majority (37.1%) of the respondents had obtained tertiary education, it was constituted of respondents from Pantang, North Legon, Oyarifa and Madina Zongo with a percentage of 82.4%, 72.2%, 44.4% and 29.2%. The findings also revealed that Oyarifa and Madina Zongo had the second highest percentages of respondents (20% and 25% respectively) attaining a senior high level of

education which contributed largely to the 19.4% of the respondents who had obtained a Senior High School certificate. Technical and vocational education was the third with 14.5% of the total population where the majority (31.8%) of respondents from Danfa fall under.

The other levels of education Junior high school, non-formal and primary obtained respectively 13.4%, 5.9% and 5.4% respectively with no respondents from Pantang and North Legon (high-income areas).

4.2.3 Average monthly household income (in Ghana cedis - GH¢)

Table 4.3 presents the distribution of average monthly household incomes (in Ghana cedis) of the respondents who took part in the study.

Table 4.3: Average monthly household income (in Ghana cedis)

Income (GHC)	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
1-500	0	0.0	0	0.0	4	8.9	6	8.3	9	40.9	6	50	25	13.4
501-1000	1	5.9	0	0.0	12	26.7	32	44.4	8	36.4	5	42	58	31.2
1001-1500	3	17.6	2	11.1	20	44.4	21	29.2	4	18.2	0	0	50	26.9
1501-2000	8	47.1	8	44.4	9	20.0	11	15.3	1	4.5	1	8	38	20.4
2001-2500	2	11.8	4	22.2	0	0.0	2	2.8	0	0.0	0	0	8	4.3
Above 2500	3	17.6	4	22.2	0	0.0	0	0.0	0	0.0	0	0	7	3.8
Total	17	100	18	100	45	100	72	100	22	100	12	100	186	100

Source: Field Data, 2021

On Table 4.3, it can be observed that 31.2% of the respondents had an average monthly household income of between 501 and 1000 Ghana cedis. Average monthly household income was between 1001 and 1500 Ghana cedis also obtained 27% followed by 1501 and 2000 Ghana cedis, 1 cedi and 500 cedis, 2001 to 2500 and above 2500 cedis with 20.4%, 13.4%, 4.3% and

3.8% respectively. The results also indicated that majority of residents in the Pantang and North Legon earn between GH¢1501 and 2000.00 per month. The results also indicate that 44.4% and 29.4% of residents at North Legon and Pngtang earn more than GH2000.00 per month while 2.8% of residents at Madina earn the same. Further, residents in Oyarifa, Madina Zongo, Danfa, and Ayimensah earn between GH¢ 1-1500.00 per month.

4.2.4 Sector of Employment

In Table 4.4, the survey captured the respective sectors in which the respondents are employed.

Table 4.4: Sector of Employment

Communities	Pantang		North		Oyarifa		Madina		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
	Legon				Zongo									
Sector	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Commerce	1	5.9	0	0.0	16	35.6	36	50.0	8	36.4	3	25	64	34.4
Public Service	4	23.5	8	44.4	13	28.9	9	12.5	5	22.7	2	17	41	22.0
Industry	0	0.0	0	0.0	3	6.7	6	8.3	1	4.5	3	25	13	7.0
Agriculture	0	0.0	0	0.0	0	0.0	0	0.0	2	9.1	2	17	4	2.2
Unemployed	0	0.0	0	0.0	2	4.4	3	4.2	3	13.6	2	17	10	5.4
Others, specify	12	70.6	10	55.6	11	24.4	18	25.0	3	13.6	0	0	54	29.0
Total	17	100	18	100	45	100	72	100	22	100	12	100	186	100

Source: Field Data, 2021

The current sector in which respondents were employed was also captured during the study. According to table 4.4, sixty-four (64) respondents representing 34.4% of respondents were employed in the service/commerce sector while forty-one (41) representing 22% of respondents were in the public service. 7% representing thirteen (13) respondents worked in the manufacturing industry, ten (10) respondents, representing 5.4% were unemployed and the remaining 28.8% were pursuing other jobs.

4.3 Assess the arrangement of solid waste management at the La-Nkwantanang-Madina Municipality

This section responds to objective one of the study which sought to evaluate the solid waste management system in the La-Nkwantanang Madina Municipality. The issues discussed in this section include the types and components of solid waste generated, the storage and disposal of the waste generated as well as services provided by the private waste contractors.

4.3.1 Types and Components of Solid Waste Generated

On Table 4.5, the study results have captured the types of waste generated in the homes of the respondents.

Table 4.5: Components of waste generated at home

Communities	Pantang		North		Oyarifa		Madina		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Type of waste														
Food wastes	17	45.9	18	52.9	27	50.9	44	53.0	11	36.7	13	41.9	130	48.5
plastic waste	17	45.9	16	47.1	22	41.5	35	42.2	13	43.3	7	22.6	110	41.0
Ashes	1	2.7	0	0.0	2	3.8	2	2.4	2	6.7	4	12.9	11	4.1
Other	2	5.4	0	0.0	2	3.8	2	2.4	4	13.3	7	22.6	17	6.3
Total	37	100	34	100	53	100	83	100	30	100	31	100	268	100

Source: Field Data, 2021

According to the results on Table 4.5 above, the most common household waste generated in all six communities is food followed by plastic waste. This is demonstrated by the fact that 48.5% of those polled reported generating food waste with 41% also generating plastic waste in their homes. Only 4% of respondents mainly from Ayimensah and Danfa primarily generated ashes in their homes, while 6.3 percent generated other types of waste such as leaves, poultry droppings, and sawdust among others.

4.3.2 Waste storage

Table 4.6 shows how respondents stored the waste they generated in their respective homes.

Table 4.6: How respondents stored their waste

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Use standard waste container	15	88.2	18	100	16	35.6	41	56.9	7	31.8	2	17	99	53.2
Use polythene bag	2	11.8	0	0	18	40.0	22	30.6	6	27.3	1	8	49	26.3
Pile the waste outside	0	0.0	0	0	0	0.0	0	0.0	4	18.2	3	25	7	3.8
Other	0	0.0	0	0	11	24.4	9	12.5	5	22.7	6	50	31	16.7
Total	17	100	18	100	45	100	72	100	22	100	12	100	186	100

Source: Field Data, 2021

As shown on Table 4.6, 88.2% of respondents in Pantang indicated the use of standard waste containers in storing their solid waste. While all respondents in North Legon indicated the same. Standard waste containers and polythene bags were the most commonly used waste storage containers in Madina Zongo and Danfa as well with a percentage of 56.9 and 31.8 respectively. The use of polythene bags obtained the highest at Oyarifa with 40% followed by Madina Zongo, Danfa, Pantang and Ayimensah with 30.6%, 27.3%, 11.8% and 8% respectively. Other means of storing waste included the use of boxes, old or spoilt buckets and pans among others which were recorded in the middle- and low-income areas. Piling waste outside was the least method used (3.8%) only in Ayimensah (25%) and Danfa (18.2%). In general, 53.2%, 26.3%, 3.8% and 16.7% stored their waste using standard waste containers, polythene bags, by piling them outside and other forms respectively.

4.3.3 Method of Solid waste disposal

On Table 4.7 below, respondents stated how they dispose of their solid waste.

Table 4.7: How respondents dispose of solid waste

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Solid Waste Disposal														
Use Private waste collector														
	17	100	18	100	39	86.7	65	90.3	10	45.5	5	41.7	154	82.8
Burning	0	0	0	0	3	6.7	4	5.6	5	22.7	2	16.7	14	7.5
Backyard	0	0	0	0	3	6.7	1	1.4	1	4.5	3	25.0	8	4.3
Use Communal dumpsites														
Burying	0	0	0	0	0	0.0	2	2.8	2	9.1	1	8.3	5	2.7
Total	17	100	18	100	45	100	72	100	22	100	12	100	186	100

Source: Field Data, 2021

According to table 4.7, even though the majority (82.8%) of the respondents use the private waste collectors in disposing of their refuse, it was constituted by all residents in Pantang and North Legon and majority of residents in Madina Zongo, Oyarifa, Danfa and Ayimensah (90.3% and 86.7%, 45.5% and 41.7% respectively). The use of Communal Dumpsites was recorded only at Danfa and Ayimensah and with the exception of Pantang and North Legon, all the other communities recorded the use of backyards for waste disposal with Ayimensah obtaining the highest of 25%. Burning and burying of waste was recorded in only middle- and low-income areas.

4.3.4 Income and method of solid waste disposal

Table 4.8 depicts the method of solid waste disposal adopted by the various income levels in the municipality.

Table 4.8: Income levels and the solid waste disposal method adopted

Income level \ waste disposal method	Backyard	Communal dumpsites	Burning and Burying	Private waste collector	Total
1 – 500	6.7	6.7	20.0	66.7	100.0
501 – 1,000	8.8	5.9	11.8	73.5	100.0
1,001 – 1,500	3.3	-	16.7	80.0	100.0
1,501-2000	-	-	4.3	95.7	100.0
2,001-2,500	-	-	-	100.0	100.0
Above 2,500	-	-	-	100.0	100.0

Source: Field Data, 2021

On Table 4.8, the use of private waste collectors was the method of solid waste disposal adopted by all respondents who earned above GH¢ 2,000. Respondents earning above GH¢ 1,000 to GH¢ 2,000 adopted in addition to the use of private waste collectors, other methods such as burying, burning and then use of the backyard in disposing of solid waste while the use of Communal Dumpsites was recorded only among respondents earning between GH¢ 1-1,000.

4.3.5 Solid waste collection method by private waste contractors

Table 4.9 presents the type of waste collection system adopted by private waste collectors waste from the homes of respondents. From Table 4.10, almost all the respondents (95.5%) in the areas surveyed indicated that private waste collectors collect their household waste using the house-to-house collection system. Followed by community bins/containers system representing 2.6%. Private waste companies do not mostly collect waste from the communal

dumpsites but with the interventions of the Danfa assembly member, they sometimes do. This accounts for it recording the least percentage of 0.6 as a method used by private waste collectors in the communities.

Table 4.9: Solid waste collection method by private waste collectors used to collect waste

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
House to house collection	17	100	18	100	39	100	59	90.8	9	90.0	5	100	147	95.5
Use of Community bins/containers	0	0	0	0	0	0	4	6.2	0	0.0	0	0	4	2.6
Use of Communal dumpsites	0	0	0	0	0	0	0	0.0	1	10.0	0	0	1	0.6
Other	0	0	0	0	0	0	2	3.1	0	0.0	0	0	2	1.3
Total	17	100	18	100	39	100	65	100	10	100	5	100	154	100

Source: Field Data, 2021

Some residents (1.3%) of the respondents indicated that private waste collectors use different methods for waste collection in the community. This is because to them the residents move their waste from their homes to meet the waste collectors due to the inability of their trucks to ply their road, so they do not consider the service house-to-house collection.

4.3.6 Payment for solid waste collection by households

Table 4.10 presents the frequency and percentage of respondents who pay or do not pay for waste collection. The result shows that 93% of respondents pay for their waste collection while the remaining 7% do not pay for their waste collection. Respondents in Pantang, North Legon,

Oyarifa and Madina Zongo all pay for waste collection while 41.7 and 36.4 percent of respondents in Danfa and Ayimensah do not pay for waste collection.

Table 4.10: Solid waste collection payment by households

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Payment														
Yes	17	100	18	100	45	100	72	100	14	63.6	7	58.3	173	93.0
No	0	0	0	0	0	0	0	0	8	36.4	5	41.7	13	7.0
Total	17	100	18	100	45	100	72	100	22	100	12	100	186	100

Source: Field Data, 2021

4.3.7 How much households pay per month in Ghana cedis

On table 4.11 the study captured the amount paid by respondents for waste collection.

Table 4.11: Monthly charge for solid waste collection

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Amount (GHC)														
0-9	0	0	0	0	0	0.0	0	0.0	2	14.3	2	28.6	4	2.3
10. – 21	0	0	0	0	7	15.6	9	12.5	7	50.0	2	28.6	25	14.5
22-31	0	0	0	0	18	40.0	29	40.3	5	35.7	2	28.6	54	31.2
32-41	0	0	0	0	10	22.2	16	22.2	0	0.0	1	14.3	27	15.6
Above 42	17	100	18	100	10	22.2	18	25.0	0	0.0	0	0.0	63	36.4
Total	17	100	18	100	45	100	72	100	14	100	7	100	173	100

Source: Field Data, 2021

From Table 4.11, the data gathered shows that 36.4% of the respondents pay an amount above 42 cedis a month for waste collection. 31.2% also pays an amount between 22 and 31 Ghana cedis per month for waste collection. 15.6% and 14.5% pay between 32 to 41 and 10 to 21

cedis every month respectively. Lastly, only 2.3% of the respondents pay an amount of 9 cedis or less for their waste collection.

The results show that all respondents in the Pantang and North Legon areas pay private waste collectors fees in excess of GH¢42.00 for their waste. Furthermore, the majority of respondents in Oyarifa and Madina Zongo pay private waste collectors fees ranging from GH¢32 to GH¢41 while the majority of respondents in Danfa and Ayimensah pay GH¢0.00-31.00 as a fee. This is as a result of the area classification by the Municipal Assembly. To validate the responses, the views of other stakeholders were sought.

1. An Assembly member stated the following with regard to how much respondents paid for the services of the waste collectors;

... they take GHC 50 a month in my area now. They wanted to increase it but together with the Assembly we prevented that increment. Even with the amount currently charged, it is dependent on the number of bins you have. So, if you have two dustbins, you pay GHC 100 a month. That is how it is and they do this collection four times in a month. The reason why these aboboyaa people are making a head way is because they take their money as they collect. So, if residents feel keeping the waste is creating nuisance, they just pay them and they take it for them.

... [Assemblyman 2]

2. An official of the waste management companies responded as follows regarding how much respondents paid for the services of the waste collectors.

... In my area, they are supposed to pay 50 cedis. We are even supposed to increase it to 60 cedis but some are always complaining. People don't value waste so they don't want to pay for it. I charge 40 cedis currently though people are paying 50 cedis at places North Legon and Madina estate.

... [Private waste company 3]

3. An official of the assembly stated the following regarding how much respondents paid for the services of the waste collectors.

... When you have an area where the road isn't all that motorable, and you fall within the low-income category, the fees differ. For instance, if you are lifting refuse in Danfa which is a low-income area, it is 30gh, at North Legon it is 50gh because it is classified as a high-income area and if it is at Oyarifa or other areas with similar socio-economic and development structures, they pay 40gh.

... [MEHO LANMMA]

4.3.8 Affordability of solid waste collection charge

On Table 4.12 the survey captured whether respondents viewed the fees charged for waste collection as affordable or not.

Table 4.12: Affordability of collection charges

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Affordable	15	88.2	14	77.8	21	46.7	23	31.9	10	71.4	6	85.7	89	51.4
Not Affordable	2	11.8	4	22.2	24	53.3	49	68.1	4	28.6	1	14.3	84	48.6
Total	17	100	18	100	45	100	72	100	14	100	7	100	173	100

Source: Field Data, 2021

The results on Table 4.12 shows that 51.4% of respondents believed that the amount they are paying for the collection of waste every month is affordable. While 48.6% also believe that the amount they pay every month for waste collection is not affordable. Most respondents in Pantang, Ayimensah, North Legon and Danfa representing 88.2%, 85.7%, 77.8% and 71.4% respectively regarding the collection charges as affordable, whereas the majority of respondents in Madina and Oyarifa indicated that the charges are not affordable.

4.3.9 Does the service provided commensurate with what you are paying?

Table 4.13 captured respondents' views on whether the service provided commensurate with the fees charged.

Table 4.13: Households' assessment of waste collection and its charge

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Yes	15	88.2	16	88.9	28	62.2	43	59.7	11	78.6	6	85.7	119	68.8
No	2	11.8	2	11.1	17	37.8	29	40.3	3	21.4	1	14.3	54	31.2
Total	17	100	18	100	45	100	72	100	14	100	7	100	173	100

Source: Field Data, 2021

The results indicate that respondents from all of the communities surveyed believe that the fees charged by private waste collectors are legitimate representing 69% of the total responses. The remaining 31% of the respondents mostly in Oyarifa and Madina did not agree with the claim that the service provided by the waste collectors befits the amount they pay each month.

4.3.10 Households' views on the ability to pay for waste disposal

Table 4.14 captured respondents' ability to pay for waste disposal

Table 4.14: Households' views on the ability to pay for waste disposal

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Yes	17	100	18	100	31	68.9	53	73.6	11	78.6	5	71.4	135	78.0
No	0	0	0	0	14	31.1	19	26.4	3	21.4	2	28.6	38	22.0
Total	17	100	18	100	45	100	72	100	14	100	7	100	173	100

Source: Field Data, 2021

The results gathered indicate that a majority of the respondents (78%) have the means, financially to pay for the services they receive from private waste collectors. 22% indicated

4.3.12 The change in Solid waste services over time

On Table 4.16 the survey captured responses on the change in Solid waste services over time

Table 4.16: change in solid waste service charge

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Stability of charge														
Yes	14	82.4	16	88.9	28	62.2	43	59.7	12	85.7	5	71.4	118	68.2
No	3	17.6	2	11.1	17	37.8	29	40.3	2	14.3	2	28.6	55	31.8
Total	17	100	18	100	45	100	72	100	14	100	7	100	173	100

Source: Field Data, 2021

Respondents were asked to indicate whether the price they pay for waste collection has changed over the period of their operations. As shown on Table 4.16, the majority of respondents in all six communities revealed that the prices they pay for waste collection have changed over time. This is represented by 68.32% of the respondents indicating a change as against 31.8% of the respondents indicating that the price they pay for waste collection has stayed the same over the period.

4.3.13 Frequency of solid waste collection within a month

Table 4.17 presents the frequencies of household solid waste collection within a month. Respondents were asked to indicate how often waste was collected in their respective homes. The results indicate that the majority (63.0%) of the respondents have their waste collected weekly. This was followed by other collection rates such as once a month or once in two months mostly in Ayimensa, Madina Zongo and Oyarifa representing 27.0, 24.6 and 23.1 percent respectively. The respondents gave varying reasons such as not generating lots of waste, not being home most of the time to get their waste taken by the waste collectors on time and also waste collectors not going by the contractual terms. Daily collection obtained a percentage of 4.5 from respondents mostly in Danfa, Ayimensah and Madina Zongo.

Table 4.17: Solid waste collection rate within a month

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Daily	0	0.0	0	0.0	0	0.0	4	6.2	2	20.0	1	20	7	4.5
weekly	13	76.5	16	88.9	24	61.5	36	55.4	5	50.0	3	60	97	63.0
bi-weekly	3	17.6	2	11.1	3	7.7	5	7.7	2	20.0	0	0	15	9.7
Three weeks	0	0.0	0	0.0	3	7.7	4	6.2	1	10.0	0	0	8	5.2
Others	1	5.9	0	0.0	9	23.1	16	24.6	0	0.0	1	20	27	17.5
Total	17	100	18	100	39	100	65	100	10	100	5	100	154	100

Source: Field Data, 2021

With regard to these areas, daily collections are made because with some of the waste generated, residents are not able to keep them for more than a day. They mostly use the services of informal private waste collectors for daily collections. In response to the collection rates, other stakeholders also indicated the following;

1. An Assemblyman stated the following with regards to how often waste collectors collect waste in the community.

... the collection is supposed to be done weekly but this is not done. Ideally, they are supposed to be collecting weekly but they are not doing. But for payment, they just come and collect their monies.

... [Assembly man 1 at LaNMMA]

2. A respondent who works in a waste collection company also claimed during an interview that:

... contractually, we are mandated to once-a-week collection.

... [Private company 3 at LaNMMA]

4.3.14 Adequacy of the rate of solid waste collection

Table 4.18 captured respondents' view on the adequacy of the rate of solid waste collection.

Table 4.18: Adequacy of the rate of solid waste collection

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Feedback														
Yes	11	64.7	8	44.4	31	79.5	49	75.4	7	70.0	2	40	108	70.1
No	6	35.3	10	55.6	8	20.5	16	24.6	3	30.0	3	60	46	29.9
Total	17	100	18	100	39	100	65	100	10	100	5	100	154	100

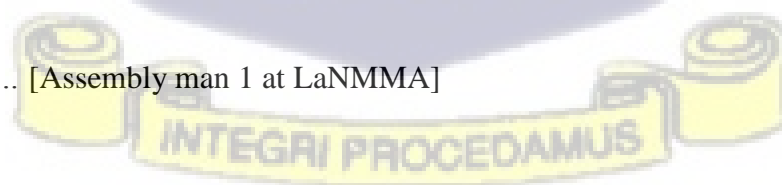
Source: Field Data, 2021

On Table 4.18, respondents were asked whether the rate of collection of waste in the community was adequate. The results indicate that 70.1% of the respondents are ok with the rate of collection while 29.9% of respondents mostly from the high-income areas (North Legon (55.6%) and Pantang (35.3%)) are not satisfied with the rate of collection. Interviews with other stakeholders were also conducted to validate the responses of the households.

An assembly member of one of the middle-income areas also stated that:

... They don't come on time, they more or less leave filth in the area because people bring the garbage in front of their houses and the one to come and collect them does not come. So, they pile the garbage and you will see some of them falling into the gutters.

... [Assembly man 1 at LaNMMA]



4.3.15 Ideal frequency for household waste collection

Table 4.19 captured the preferred waste collection rate by households.

Table 4.19: Preferred household waste collection rate

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Preferred collection rate														
Daily	0	0.0	0	0	0	0.0	2	12.5	1	33.3	2	66.7	5	10.9
Once every week	2	33.3	0	0	5	62.5	5	31.3	2	66.7	0	0.0	14	30.4
Twice a week	4	66.7	10	100	3	37.5	9	56.3	0	0	1	33.3	27	58.7
Total	6	100	10	100	8	100	16	100	3	100	3	100	46	100

Source: Field Data, 2021

Respondents who indicated that the rate of waste collection was unsatisfactory were asked to indicate how often they would like household waste to be collected.

The results on Table 4.19, show that the majority of respondents in Pantang, North Legon and Madina Zongo prefer that their waste be collected twice a week, while the majority of respondents in Oyarifa and Danfa prefer that their waste be collected once a week. This was followed by a daily collection which was mainly the preference of respondents in Ayimensah and Danfa. In total 58.7, 30.4 and 10.9 percent of respondents indicated that they would want household waste to be collected twice a week, once a week and daily respectively.

4.3.16 Has there been situations where they have not collected waste within a specified period

On Table 4.20 the survey captured responses on households' views on waste not collected by private contractors.

Table 4.20: Households' Views on waste not collected by private contractors

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Yes	3	17.6	2	11.1	29	74.4	51	78.5	8	80.0	3	60	96	62.3
No	14	82.4	16	88.9	10	25.6	14	21.5	2	20.0	2	40	58	37.7
Total	17	100	18	100	39	100	65	100	10	100	5	100	154	100

Source: Field Data, 2021

On Table 4.20, the majority of respondents in Pantang and North Legon stated that their waste was always collected on time while majority of respondents in Oyarifa, Madina Zongo, Danfa, and Ayimensah stated that there have been numerous instances where their waste was not collected on time accounting for 62.3% of the total respondents.

4.3.17 Frequency of waste not collected on time

On Table 4.21 the survey captured respondents' views on the frequency of waste not collected on time.

Table 4.21: Frequency of waste not collected on time

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Very Frequent	0	0	0	0	0	0.0	1	2.0	0	0.0	0	0.0	1	1.0
Frequent	0	0	0	0	3	10.3	6	11.8	2	25.0	2	66.7	13	13.5
Once in a while	2	66.7	2	100	23	79.3	32	62.7	6	75.0	1	33.3	66	68.8
Just once	1	33.3	0	0	3	10.3	12	23.5	0	0.0	0	0.0	16	16.7
Total	3	100	2	100	29	100	51	100	8	100	3	100	96	100

Source: Field Data, 2021

The results show that almost all the respondents in the six communities representing 68.8% indicated that once in a while there have been situations where waste was not collected within the specified period. Followed by respondents who had experienced waste not collected on time just once with a percentage of 16.7. In mostly the middle- and low-income communities, respondents indicated that there have been numerous times that waste was not collected on time, especially Ayimensah (66.7%).

4.3.18 Views on causes accounting for waste not being collected on time.

Respondents gave varying responses to whether there have been situations where they have not collected waste within a specified period. Responses are presented below as follows;

... Yeah, some of the collectors also have complained about access routes, some of the roads are bad, so they can't even access those areas so it also comes back to the government. You know in Madina for example, some areas have seen nothing at all in terms of accessible roads. The roads in some areas are not good and it affects their work. There are other challenges but I think that is one of the major challenges that I have heard of.

... [Assemblyman 2]

An official of the Private waste company also states the following regarding the causes accounting for not collecting waste on time.

- *.... And the nature of our roads too is not helping us. In the Municipality, most of the roads are very bad. In some places it is impossible to use a compactor to work there. It is impossible because if you try it, you are going to spend so much money to take the truck out because it will get stuck. Some of the roads too are not accessible that is why reluctantly we allow some of these tricycles to go to some of these places to collect the waste. Most of them are not for us, they are for these boys and you cannot help but look on reluctantly and make them work because those places your truck cannot go there.*

... [Private waste company 2 at LaNMMA]

4.3.19 How did you handle uncollected waste?

On Table 4.22 the survey captured how households handle waste not collected on time.

Table 4.22: Household alternative to private waste collection

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Alternative methods to dispose of waste														
Contracted another service provider	1	33.3	2	100	10	34.5	29	56.9	3	37.5	0	0.0	45	46.9
Left the waste uncollected	2	66.7	0	0	16	55.2	17	33.3	2	25.0	2	66.7	39	40.6
Burned it	0	0.0	0	0	3	10.3	5	9.8	1	12.5	1	33.3	10	10.4
Buried the waste in the ground	0	0.0	0	0	0	0.0	0	0.0	2	25.0	0	0.0	2	2.1
Total	3	100	2	100	29	100	51	100	8	100	3	100	96	100

Source: Field Data, 2021

In this section, respondents were asked to describe the alternative method they used when waste collection companies failed to arrive on time. According to Table 4.22, the majority of Pantang, Oyarifa and Ayimensah respondents indicated that they left their waste uncollected until the designated waste collection companies arrived. However, all respondents in North Legon, Madina Zongo and Danfa hired the services of other waste collectors mostly informal to collect their garbage. Some respondents in the middle- and high-income communities also indicated that their waste when not collected on time are bent. In Danfa, 25% of the respondents also indicated that their waste was buried in the ground when not collected on time.

4.3.20 Where do Private Companies Dispose of the Waste

On Table 4.23, the majority (98.1%) of the respondents have no knowledge of where service providers dispose of waste collected from their homes against 1.9% who have information on where waste collected from their homes by service providers is disposed of.

Table 4.23: Location of waste disposal by service providers

Communities	Pantang		North		Oyarifa		Madina		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Feedback														
Yes	1	5.9	0	0	1	2.6	1	1.5	0	0	0	0	3	1.9
No	16	94.1	18	100	38	97.4	64	98.5	10	100	5	100	151	98.1
Total	17	100	18	100	39	100	65	100	10	100	5	100	154	100

Source: Field Data, 2021

Other stakeholders were also interviewed in relation to the location of where waste collectors dispose of the waste. These were some of the varying responses attained;

1. With regards to where waste collectors dispose of the waste they collect, an interviewee from the Private Waste Company said that:

... Yes! If you get to Nsawam, after, and go beyond the town for some few meters that is after the prison, you turn right heading towards the village called Dobgeo. There is a road that links to the Aburi Mountains, you then take that road to the landfill site. So, in and out you are doing like over 100km just to go and offload.

... [Private waste company 1 at LaNMMA]

2. Another Private Company official also had this to say;

... we send them to the dump sites. I don't know if you are aware but I think there are only about two or three dump sites operating within Accra. One is in Kasoa, the other at Nsumia. So, we go and dump the waste there. It's crude

dumping, as there's no recycling of the waste there. We have a recycling plant which is operated by Zoomlion in Adjen-kotoku. But at times it gets full.

... [Private waste company 1]

3. There were varying responses to this particular question during the interviews. One other respondent (an Assemblyman) said that:

... in Madina, nothing of that sort is done when it is collected. Let's say Zoomlion collects the waste wherever they send it to we don't know. What I know is that when the Municipal Assembly does the collection, they send it to the Kpone dumping site outside the Municipality. That's where the Assembly sends what they collect but with Zoomlion I don't know if they send it to their own plant zone or elsewhere.

... [assemblyman 2]

4. Another Assemblyman provided the following responses to the question posed;

... Yes. Around Prampram. I cannot get the name of the place exactly; it has escaped me but I think it is along the road to Prampram.

... [Assemblyman 3]

5. Another Assemblyman also commented on this as follows;

... For that one I don't know where they dump it. Actually, some say they go to Achimota. I don't know specifically that one. They've been complaining about the dumping site but where they dump it, I don't know.

... [assemblyman 1]

4.4 The nature of partnership between Private Service Providers and the Municipal Assembly

This section responds to objective two of the study which sought to assess the nature of the partnership between private service providers and the Municipal Assembly. The issues discussed in this section include the types of Public Private Partnerships that exist in LaNMMA, the types of private solid waste collectors operating within the Municipality and how residents got information on these private waste collectors.

4.4.1 Public- Private Partnership arrangement in the Municipal Assembly

The issues discussed in this section present data on the Public-Private Partnership arrangement that exists in LaNMMA and the roles played by both parties. Respondents gave varying responses regarding the PPP arrangement and the roles of the various actors.

4.4.1.1 Public-Private Partnership arrangement

1. An official of the waste management companies responded as follows regarding the arrangement put in place by the Assembly regarding firms' activities in waste management.

... the assembly has divided the municipality into zones, and each zone is assigned to a waste management/disposal company. We pay for the concession/zone and then the assembly has authority over us and makes sure we go to the community for the waste. They even regulate the fees we charge for the collection indirectly.

... [private waste company 2]

2. An official of the assembly stated the following regarding the arrangement they have with the Private companies.

... the area has been zoned for accredited waste contractors. We have eight (8) accredited waste contractors responsible for door-to-door waste collection under a

franchise agreement. We also have a contract agreement with Zoomlion for the highway and public places. So, the door-to-door service is the franchise agreement with accredited waste contractors. They are responsible for their respective zones where refuse is collected through the use of compactor trucks and is transported to the final disposal site at Kpone or Nsumia.

... [MEHO LaNMMA]

4.4.1.2 Roles and responsibilities of stakeholders

1. Another Private Company official explained the relationship with the Assembly as follows;

..... they have authority over us and they supervise us to make sure we do our job. Their responsibility is to ensure the waste is collected. Aside that role, everything else from collection to disposal is on the private contractor.

... [Private waste company 1]

4.4.2 Types of private solid waste collectors operating in the Municipality

On Table 4.24 below, respondents stated the types of Private waste companies they use to dispose of their solid waste.

Table 4.24: Types of private solid waste collectors

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Private formal waste collectors (e.g. Zoomlion)	16	94.1	18	100	20	51.3	29	44.6	3	30.0	1	20	87	56.5
Informal waste collectors (e.g. Kaya bola)	1	5.9	0	0	19	48.7	36	55.4	7	70.0	4	80	67	43.5
Total	17	100	18	100	39	100	65	100	10	100	5	100	154	100

Source: Field Data, 2021

The results on Table 4.24 indicate the presence of both formal and informal private waste providers in the Municipality. Though the results show that, a majority (56.5%) of the respondents have their waste collected by private formal waste collectors (eg. Zoomlion), this is not the case for all the areas under study. The results showed that majority of respondents in North Legon, Pantang and Oyarifa representing 100%, 94.1% and 51.3% respectively indicated that the most common private solid waste collectors use are the private formal waste collectors whereas major of respondents in Ayimensah, Danfa and Madina Zongo (80%, 70% and 55.4% respectively) use the services of informal collectors (e.g. Kaya bola).

4.4.3 Information on private waste collectors

On Table 4.25, the study captured how respondents got to know about the private waste collectors they work with. The results indicate that, for majority (43.5%) of the respondents, the private waste collectors came to introduce themselves personally. About thirty-seven percent (33.1%) got to know of their private waste collectors through their neighbours. While 18.8% and 4.5% got to know the waste companies through their Assembly member and through radio advertisements.

Table 4.25: Information on private waste collectors

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
They came to introduce themselves	15	88.2	14	77.8	16	41.0	16	24.6	5	50.0	1	20	67	43.5
Through a neighbour	2	11.8	1	5.6	15	38.5	32	49.2	1	10.0	0	0	51	33.1
Assembly member	0	0.0	2	11.1	6	15.4	14	21.5	3	30.0	4	80	29	18.8
Through the radio	0	0.0	1	5.6	2	5.1	3	4.6	1	10.0	0	0	7	4.5
Total	17	100	18	100	39	100	65	100	10	100	5	100	154	100

Source: Field Data, 2021

On Table 4.25, Pantang and North Legon respondents had almost identical sources of information on private waste collectors. Private waste collectors came to these areas to introduce themselves to the residents, according to the respondents. However, the majority of residents in Oyarifa and Madina Zongo had their neighbours as the common source of information about private waste collectors. Assembly members being the source of information on the private waste collectors was the highest among residents of Ayimensah with a percentage of 80.

4.5 Performances evaluation of service providers and how much residents are willing to pay for enhanced services

This

4.5.1 How households assess private waste collectors

On how respondents would assess private waste collectors in the community was carried out using means, standard deviation and variance to analyse aspects of the data collected from respondents. Responses were rated using a 5-point Likert Scale where: 1= very good, 2= good, 3=moderate 4=bad, 5= very bad. The data is presented in Table 4.26.

Table 4.26: Households' assessment of private waste collectors

	Collection rate	Logistics and waste collection equipment	Customer relations	Amount charged for waste collection
N	186	186	186	186
Mean	2.46	3.03	2.31	3.04
Median	2.00	3.00	2.00	3.00
Std. Deviation	0.78	0.91	0.71	0.80
Variance	0.61	0.08	0.51	0.64
Minimum	1.00	1.00	1.00	1.00
Maximum	5.00	5.00	5.00	5.00
Sum	273.00	336.00	256.00	337.00

Source: Field Data, 2021

The results on Table 4.26 indicate that majority of the respondents think the amount charged for waste collection was bad with a mean value of 3.04. Respondents also believed that the logistics and waste collection equipment used in the community is not good with a mean value of 3.03. Collection rate also had a mean value of 2.46 followed by customer relations with a mean value of 2.31.

4.5.2 How will you rate the performance of service providers in the municipality?

Table 4.27 captured how households rated the performance of waste providers in the municipality

Table 4.27: Performance rating of private waste providers by Households

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Poor	0	0.0	0	0.0	3	7.7	5	7.7	0	0.0	0	0	8	5.2
Fair	5	29.4	7	38.9	17	43.6	38	58.5	6	60.0	3	60	76	49.4
Good	12	70.6	10	55.6	19	48.7	20	30.8	3	30.0	1	20	65	42.2
Very Good	0	0.0	1	5.6	0	0.0	2	3.1	1	10.0	1	20	5	3.2
Total	17	100	18	100	39	100	65	100	10	100	5	100	154	100

Source: Field Data, 2021

On the Table 4.27, respondents were asked to rate the performance of service providers in the municipality. Though the results indicate majority (49.4%) of the respondents rated the performance of service providers in the municipality as fair, this was mostly respondents in Danfa, Ayimensah and Madina Zongo, whiles the majority of respondents in Pantang and North Legon rated the waste collectors' performance as 'good' with 42.2%. respondents mainly from Madina Zongo and Oyarifa rated the performance as poor with a percentage of 5.2.

4.5.3 Performance rating of the two main forms of private waste providers

Table 4.28 captured how households rated the performance of the two main types of waste service providers in the municipality

Table 4.28: Performance rating of the two main forms of private waste providers

Type of private waste Contractors	Performance rating			
	Poor	Fair	Good	Very good
Private formal waste collectors (e.g., Zoomlion)	5.7	43.4	45.3	5.7
Private Informal waste collectors (e.g., Kaya bola)	2.7	43.2	54.1	0.0

Source: Field Data, 2021

On the Table 4.28, the results indicate a better performance rating for the informal private waste collectors compared to the formal. Though majority of respondents rated the performance of both collectors to be good, the informal collectors had a slightly higher percentage. Also, the percentage ratings for poor and fair were also slightly lower for the informal collectors compared to the formal. With 5.7% of households rating the services of the formal collectors to be very good.

Representatives of LaNMMA were also asked to rate the performance of the waste collectors in the municipality to validate the responses.

1. It was said during the interviews by one Assemblyman with regard to the performance of service providers in the community that;

... The contract they have with residents is that every week they will pick once but unfortunately, what is on the pink sheet it's not what we are seeing. Sometimes it takes even three weeks and they are not picking, I have to be

calling, calling, sometimes I even call their supervisor and then he will tell me they will come but they wouldn't come. It's rather unfortunate that they will not come. Ideally, for where I am, they are supposed to come every Thursday. I wish you are doing a video instead I would have shown you how they have packed the solid waste along the streets where they are supposed to come and pick it up. They haven't and even next week I doubt if they will come. I have complained to them several times but to no avail. I have complained to the Municipal officer as well and we are still thinking about when these waste contractors will stick to their promise.

... [Assemblyman 1 at LaNMMA]

2. Another Assemblyman also stated the following;

... I think they changed the waste contractors. The current ones have been operating here for the past five years but we were hoping there would be some competition because I think some people are enjoying the monopoly. It is only recently that these aboboyaa people are trying to break the monopoly by collecting waste here as well. Some residents are withdrawing from the use of these formal waste contractors to the use of the aboboyaa. Aside they coming on time people are also complaining that it is expensive. They collect the waste just once a week that is four times in a month and to pay 40 cedis is too much.

... .. [Assembly man 2 at LaNMMA]

4.5.4 Households' willingness to pay more for waste collection

Table 4.29 captures respondents' willingness to pay more for waste collection. The results indicate that majority (66.9%) of the respondents are not willing to pay more for improved service providers. These respondents are mainly from North Legon (72.2%), Oyarifa (71.8%),

Pantang (70.6%), and Madina Zongo (66.2%). Danfa had an equal percentage (50%) with majority (60%) of respondents in Ayimensah willing to pay more for improved service from the service providers.

Table 4.29: Households’ willingness to pay more for waste collection

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Yes	5	29.4	5	27.8	11	28.2	22	33.8	5	50.0	3	60	51	33.1
No	12	70.6	13	72.2	28	71.8	43	66.2	5	50.0	2	40	103	66.9
Total	17	100	18	100	39	100	65	100	10	100	5	100	154	100

Source: Field Data, 2021

4.5.5 Conditions for households’ Willingness to pay more for waste collection

On Table 4.30 the survey captured the conditions given by respondents willing to pay more for waste collection.

Table 4.30: Conditions for paying more for waste collection

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Improved collection rate	4	80	1	20	9	81.8	15	68.2	2	40	2	66.7	33	64.7
Equipment and logistics used for collection	1	20	1	20	2	18.2	6	27.3	1	20	0	0.0	11	21.6
Improved customer relation	0	0	3	60	0	0.0	1	4.5	2	40	1	33.3	7	13.7
Total	5	100	5	100	11	100	22	100	5	100	3	100	51	100

Source: Field Data, 2021

Respondents were asked to identify the factors that will cause them to pay more to waste collectors in this section. The results presented show that, 64.7%, 21.6% and 13.7% representing improved collection rate, equipment and logistics used for collection and

improved customer satisfaction respectively. The results also indicated that the majority in Pantang, Oyarifa, Madina Zongo, Danfa, and Ayimensah indicated their wiliness to pay more for waste collectors if their collection rate improves whiles majority of the respondents in North Legon emphasized on improved customer relations.

When a representative of LaNMMA was interviewed in relation to the conditions, one Assemblyman said during the interview that:

... I think, the waste companies have to just make sure that they respond to their terms of reference, that is working weekly. They should try to pick the waste on time. There are other people who have their proposals under examination. They should just make sure they work with what they are supposed to do and be truthful to the people.

... [Assemblyman 1 at LaNMMA]

4.6 Challenges that militate against the creation of an enabling environment for the private sector in waste management

4.6.1 Consumers' perspective of problems of solid waste collection by service providers

Households were to indicate the challenges with regard to waste collection service in their respective areas of residence. On Table 4.31, respondents were asked to identify the barriers to the creation of an enabling environment. The results show that the majority of the respondents highlighted inadequate service providers as a major challenge with a percentage of 25.8. This was followed by high cost of waste management representing 22%. Unreliable service providers and untidiness of the environment had a percentage of 19 and 11 respectively. In each community, respondents' responses differed from one another. The majority of respondents in Pantang and Ayimensah identified 'inadequate service providers in the municipality as the main barrier to the creation of an enabling environment whiles the majority of respondents in North Legon and Danfa indicated that the most significant impediment to an

enabling environment in their area is the 'high cost' of waste collection. However, respondents in Madina Zongo and Oyarifa had differing perspectives.

Table 4.31: Challenges with solid waste management

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Inadequate service providers	10	41.7	6	28.6	9	17.3	19	23.8	6	22.2	9	36	59	25.8
High cost	6	25.0	11	52.4	12	23.1	10	12.5	8	29.6	4	16	51	22.3
Unreliable service providers	3	12.5	3	14.3	13	25.0	22	27.5	3	11.1	4	16	48	21.0
Lack of professionalism	2	8.3	1	4.8	14	26.9	17	21.3	5	18.5	5	20	44	19.2
Untidiness of the environment	2	8.3	0	0.0	4	7.7	11	13.8	5	18.5	2	8	24	10.5
Others	1	4.2	0	0.0	0	0.0	1	1.3	0	0.0	1	4	3	1.3
Total	24	100	21	100	52	100	80	100	27	100	25	100	229	100

Source: Field Data, 2021

The majority of respondents in Madina Zongo indicated that the main challenge affecting the creation of an enabling environment is 'unreliable service providers,' whereas the majority of respondents in Oyarifa indicated that the main challenge is 'lack of professionalism' of waste collectors.

4.6.2 Challenges facing waste management.

Data analysis on challenges facing waste management in the community was carried out using Means, standard deviation and variance. The questions were 5-point Likert Scale where: 1= Strongly Disagree 2= Disagree 3= Undecided 4= Agree 5= Strongly Agree is presented in Table 4.32.

The results indicated the most common challenge facing waste disposal in the municipality as inadequate landfill disposal sites with a mean of 4.21. This was followed by high cost of waste

management with a mean of 3.77. Lack of education and awareness, Weak capacity of waste management firms, Inadequate landfill disposal sites, Inadequate funds and logistics followed in that order with mean values of 3.61, 3.28, 3.27 and 3.23 respectively. Finally, the results indicated that Negative attitude and behaviour of people was the least challenge facing waste management in the community.

The results show that majority of respondents in Oyarifa, Madina Zongo, Danfa and Ayimensah indicated the generation of bad odour as the main problem they face as a result of irregular waste collection. Furthermore, a substantial number of respondents (representing 44%, 36.8%, 34.9%, 30.8% and 30.2%) in Pantang, Danfa, Ayimensah, North Legon and Madina Zongo also indicated that the irregular collection of waste in that area causes the breeding of mosquitoes. Meanwhile, the majority of respondents in North Legon stated that irregular waste collection makes their compound dirty and untidy.

Table 4.32: Challenges facing waste management.

	Negative attitude and behaviour of people	Lack of education and awareness	Inadequate funds and logistics	Inadequate landfill disposal sites	Weak policy enforcement and regulation	Weak capacity of waste management firms	High cost of waste management
Total responses	136	136	136	136	136	136	136
Mean	3.15	3.61	3.23	4.21	3.27	3.28	3.77
Std. Deviation	1.05	0.89	0.91	0.82	0.90	0.81	0.69
Variance	1.11	0.785	0.84	0.68	0.80	0.66	0.47
Minimum	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Maximum	5.00	5.00	5.00	5.00	5.00	5.00	5.00

Source: Field Data, 2021

4.6.3 Problems experienced with irregular collection of waste

On Table 4.33 above respondents were asked to indicate the problems they experience with the irregular collection of waste.

Table 4.33: Problems with irregular waste collection

Communities	Pantang		North Legon		Oyarifa		Madina Zongo		Danfa		Ayimensah		Total	
Effects of irregular waste collection	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
It generates bad odour	8	32	7	26.9	25	53.2	61	48.4	26	60.5	9	47.4	136	47.6
Breeds mosquito	11	44	8	30.8	13	27.7	38	30.2	15	34.9	7	36.8	92	32.2
Makes the compound dirty and untidy	6	24	11	42.3	9	19.1	25	19.8	2	4.7	3	15.8	56	19.6
Other	0	0	0	0.0	0	0.0	2	1.6	0	0.0	0	0.0	2	0.7
Total	25	100	26	100	47	100	126	100	43	100	19	100	286	100

Source: Field Data, 2021

The results on Table 4.33 show that majority of the respondents highlighted the generation of bad odour as a major problem faced with irregular collection of waste with a percentage of 47.6. This was followed by the breeding of mosquitoes which is a major course malaria representing 32.2%. Untidy compounds and others such as the spread of disease, injuries and damages and reduction in productivity had a percentage of 19.6 and 0.7 respectively. In each community, respondents' responses differed from one another. The majority of respondents in the middle- and low-income communities identified the generation of bad odour to be their major problem with irregular waste collection while the majority of respondents in North Legon and Pantang indicated the untidiness of their surroundings and breeding of mosquitoes as their major challenge.

4.7 Chapter Summary

Chapter Four presented the data for the study which came from responses from 186 respondents and the structured interviews conducted. The analysis started with the demographic characteristics of respondents and was followed by the analysis of the objectives designed for

the study. It has been established that private waste collectors are the main form of solid waste disposal in the Municipality. The most common challenges facing waste disposal in the Municipality include inadequate landfill disposal sites, high cost of waste management and Lack of education and awareness. Others were the weak capacity of waste management firms, inadequate landfill disposal sites, inadequate funds and logistics and negative attitude and behaviour of people.



CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Introduction

The results of the study are discussed in this chapter. This chapter has been categorised into two sections. Section one discussed the demographic characteristics of the respondents comprising of their age, gender, level of education, average monthly income as well as the sector they are employed in. Section two dealt with a discussion of variables aimed at achieving the research objectives set for the study. It further presents a discussion on the types of solid wastes generated, how the waste generated is stored for disposal and challenges that militate against the creation of an enabling environment for the Private Sector in Waste Management in the study area.

5.2 Demographic characteristics

The findings from the study showed a majority of the respondents are above 51 years of age indicating that the respondents were not within the youthful age bracket. Further, given that this was a household survey, it was expected that heads of the household will be a bit advanced. With regards to the gender of respondents, the findings revealed that the majority of the respondents were females. A number of reasons can be attributed to this and including the fact that most women spend much time in the house as they combine both productive and reproductive roles (Monney et al., 2013; Gyimah et al., 2021). Again, women often work close to their homes due to their dual roles of caring for the home and working to contribute to the family. Thus, the possibility of the researcher meeting female homemakers was high. In terms of highest educational qualification, majority of the respondents were found to have obtained a higher educational qualification (tertiary level) signalling a high level of literacy within the study area. This result reasserts the perception held by many that the level of education and

literacy rate is high in urban, peri-urban and near-urban areas of Ghana. Also, the information provided was sufficient to make conclusions because of the high levels of education of the respondents.

Further, the study findings indicated that the majority of the households involved in the study had an average monthly income earning of 501-1000 Ghana cedis above the monthly minimum wage of Ghana which stands at 363.31 Ghana cedis. This finding is consistent with that of Gyimah et al. (2021) who discovered that a majority of respondents within the middle-income level earned more than GHS 500 monthly. The analysis of the sector respondents employed corresponds with the findings of the highest level of educational qualification. Among the respondents who were employed in the formal sectors, (both public and private) majority of them have higher educational attainments, i.e., above secondary education. The study also identified a close relationship between income levels and waste disposal methods respondents use. Where all of the respondents earning above GHS 2,000 disposed of their waste using private collectors. This indicates that there is a higher chance of people adopting the sustainable means of disposing of solid waste the wealthier they become as indicated by Rodić and Wilson (2017).

5.3 Assess the arrangement of solid waste management at the La-Nkwantanang-Madina Municipality

There were various types of solid wastes identified in the study of which food wastes/organic waste was the principal waste generated by several households. This was trailed by plastic wastes, other waste types and ashes. This reasserts the position that, the composition of solid waste in the urban centres in Ghana is predominantly made of organic (biodegradable)

materials and a high percentage of plastic waste followed by inert materials which include wood ash, sand, and charcoal (Asase et al., 2009; Downmore et al., 2011; Oteng-Ababio, 2014).

The storage of solid waste before disposal is also crucial in the organisation of solid waste in rural and urban Ghana (Boateng et al., 2016). The storage of wastes generated by households before collection and transportation to the dumpsite or landfill site involves the use of various receptacles. These receptacles include polythene bags, propylene sacks, metal bins, and disposal of waste in pits dug at the back of the house (Downmore et al., 2011). The findings indicated that standard waste containers were the dominant waste receptacle used by households. The findings thus contradict the findings by Boateng et al. (2016) which suggest that polythene bags were the main waste storage medium before disposal in some communities in Ghana. Several factors were found to contribute to this and includes the availability of waste bins which apparently were provided by the service providers. Others factors include feasibility and appropriateness of waste bins in handling solid waste.

In terms of the collection of waste, the findings show that most households had their waste collected by private waste collectors which is not surprising as it is the case for most urban areas and indeed this point is corroborated by other studies such as (Fobil et al., 2008; Oteng-Ababio, 2010). Interviews with the key stakeholders showed that the formal waste contractors such as zoom lion are the main private waste collectors/contractors. This wasn't the same for respondents in the middle- and low-income areas. The services of the informal waste collectors were dominant in these income areas due to factors such as accessibility and the frequency of collection by the formal collectors. The findings in terms of information on waste contractors also show the enthusiasm of the private companies in waste collection and their level of control as the majority of the households were engaged directly by the waste companies.

Moreover, on the waste collection systems adopted by the said private waste collectors from various households, it was observed that the use of the house-to-house collection system is dominant. This is confirmed by the study of Monney et al (2013), where they found that private waste companies devote their resources to areas where they would readily recover cost viz. subscribers to house-to-house collection while neglecting those who do not readily pay for waste collection services. The findings on payment for solid waste disposal buttresses the point of private waste collectors mainly using the house-to-house waste collection system as they are interested in making returns or profits (Hazra and Goel 2009). It showed that majority of the households paid to dispose of their solid wastes with private waste collectors.

It can be deduced from the findings that the majority of the households pay more than 42.00 cedis monthly to dispose of their solid waste. The reason why majority of the households are paying higher as compared to other available price ranges is largely attributed to the residential classification into high-level areas with a direct link to their household monthly income and also the kind of service provided by waste collectors. Even though the majority of the households deemed the solid waste collection charges affordable, a substantial number of households deemed the charges to be unaffordable. These findings confirm the responses retrieved on how much households pay per month to have their solid wastes disposed of, where some interviewees indicated that no matter the weight of the waste collected, the fact that there are two dustbins, they are charged separately thus, increasing the cost of disposing of household solid waste. Hence, the indication by some respondents on the unaffordability of the solid waste collection charges.

The indication by the majority of households that the services provided by the private solid waste collectors buttress the earlier indication that majority of the households are paying more in comparison to other available price ranges may be attributed to the kind of service provided. As per the findings majority of the respondents deemed the charges paid befit the services rendered. Notwithstanding the affordability of solid waste collection charges as indicated by majority of the households, these charges are noted to be unstable as some respondents indicated that the collection charges of disposing their household solid wastes have changed on numerous occasions over the period, registering an unstable pricing of waste disposal.

5.4 Assessing the nature of partnership between private service providers and the Municipal Assembly

Since governments in many cities are unable to address waste management-related issues on their own (Metin et al., 2013), private sector participation in infrastructure development has grown in importance over time (Olukanni & Nwafo, 2019). As shown in the conceptual framework, State and local governments at all levels struggle to provide adequate solid waste management infrastructure, which has forced the government to look for alternative sources of financing solid waste management infrastructure (Marshall et al., 2013). This, according to Kpessa et al. (2011), is a result of the disintegration of political and economic structures during the 1980s in the sub-Saharan Africa (SSA), which brought about a sharp decline in the provision of basic services. The delivery and management of sanitation services were poor and left out a large segment of the population during this period (Dos Santos et al. 2017). Historically, municipal solid waste (MSW) management services have primarily been provided by local government authorities. Over time, the participation of the private sector in providing public services such as waste-related services has grown particularly as waste management practices have evolved to encompass various complex technological, economic, and

environmental issues resulting in a heavy burden on the municipal budget of many small municipalities (Marshall et. all, 2013; Bugge et. all, 2019). Public-private partnerships (PPP) in operations were often the proposed response to overcome government failures in public service delivery. These failures can be attributed to structural challenges such as too many workers, inadequate supervisors, few incentives for better performance and limited finance which will lead to a reduction of the cost of waste management and improve service quality (Mahalingam et al. 2011; Spoann et. all, 2019). Consequently, partnership with the private sector is considered instrumental in the sustainable management of waste. In line with other studies (Owusu-Sekyere et al., 2013; Oduro-Kwarteng & van Dijk, 2013), the findings show that LaNMMA like most cities in Ghana is operating a PPP arrangement in waste management which is in line with the extension of the market mechanisms of the New Public Management (NPM) and decentralization of local services to the local governments. The municipal assembly currently operates the following types of privatizations.

5.4.1 Franchise agreement (Formal Contractors)

Private waste collection companies perform door-to-door collection, which is typically done on a franchise basis, at a fixed price in high- and middle-class income areas. In this form of PPP, the private companies that operate within the municipality are assigned to specific zones to manage. For a limited period, private sector service providers compete for a zonal monopoly. As compared to public sector enterprise, the private sector is thought to possess qualities like political independence, economic sanity, efficiency, dynamism, and innovation. (Owusu-Sekyere et al., 2014). The La Nkwantanang-Madina Municipality is zoned with eight (8) accredited waste contractors responsible for door-to-door waste collection at the residential areas under this agreement. Under the terms and contract of agreement, private companies are supposed to do lifting once a week for every household and collect monthly subscription which

was confirmed from the data where majority of the households indicated their waste were being picked on weekly bases and also pay for the services. The Government regulates the charges by setting the rates in the Assembly's fee-fixing resolution for each zone based on the economic classification of the area. This is to ensure that the total cost is not pushed to the beneficiaries but allows the beneficiaries to pay a percentage of the total cost while the private companies also bear a part of the cost. The study revealed that private companies in the LaNMMA pay a franchise fee to the Assembly for operating within the Municipality. Their roles include; the provision of bins to households, collection of refuse with the use of compactor trucks and transportation of waste to the final disposal sites. However, those who do not use this service, who are typically from low-income areas, place their trash in central containers placed at designated locations for regular emptying for a very small fee.

5.4.2 Sanitation Improvement Package (SIP)

Discussions with informants revealed that, under this agreement, private contractors provide services at the highway and public places and are paid a franchise fee by the assembly quarterly. It is the client that pays the contractor under this agreement because the private companies are unable to charge for the services provided at these places. The Assembly currently has one SIP contract agreement with Zoomlion. Their responsibility includes; sweeping collection, transportation and haulage of skips to the final disposal site.

5.4.3 Pay – as – you – go (Informal contractors)

This is an agreement with the informal waste contractors (aboboyaa) within the municipality who also operate within the central business and some residential areas. They render daily services and pay the franchise fees to the Assembly out of their daily collection charge. They

operate in areas that are not accessible by the bigger compactor trucks used by the formal companies. There are also a lot of restaurants, and chop bars among others in the commercial areas that deal with putrescible waste (waste that can easily decompose) like cold stores which cannot keep such items that go waste for more than one week. As such refuse generated in such areas must be collected at the final disposal centre. It was found in this study that LA Nkwantanang-Madina Assembly has seventy-eight (78) informal waste collectors operating in the Municipality.

5.4.4 Assembly Collection

In Ghana, MMDAs are in charge of the final disposal of solid waste through their Environmental Health and Sanitation Departments and Waste Management Departments. The sanitation policy gives Assemblies the authority to contract with service providers to provide services while utilizing their oversight role to ensure that high-quality services are delivered. Further, the policy also requires that where necessary the Assembly should come in and provide such essential services for the public good. Given this, the Assembly also undertake waste collection at certain parts of the municipality. It was established that about 20% of the total waste generated in the municipality is collected by the Assembly. LaNMMA is responsible for the provision of final disposal sites for the private companies and also serve as a monitoring mechanism who monitor and supervise the operations of the private contractors.

The inference drawn from the household survey in terms of waste disposal affordability and waste management practices of the municipality indicated that the majority of the respondents have access to and can afford waste services as a result of subsidised prices. This reaffirms the rationale for the private sector involvement (PSI) in solid waste collection, which is to improve efficiency (reduce cost) and effectiveness of service delivery (service quality) through

competition in the market where private sector providers compete for a zonal monopoly to render services over a period of time. This is to ensure that the environmental aspect of sustainable development is integrated into solid waste management (ISSER, 2012).

5.5 Performances evaluation of service providers

In evaluating the performances of solid waste service providers in terms of how households assess private waste collectors, a four-point criterion was used. These are: collection rates, logistics and waste collection equipment, customer relations and charged waste collection fees. The amount charged for waste collection and logistics and waste collection equipment are a little over moderate but not bad per the Likert scale explanation. This implies a moderate performance of solid waste service providers in providing logistics and equipment for waste collection and the amount charged for waste collection. In terms of the quality of service provided, the results demonstrate that service providers were rated moderately on the scale, which indicates that more work needs to be done to improve their services. This finding is consistent with another study (Yoada et al., 2014). Discussions with stakeholders indicate that despite the fairly good rating of service providers, they often pick up waste sometimes over three-week periods. It can be observed that their services are not up to the level that households are greatly satisfied with. Indeed, this has been the case in most communities as revealed in other studies (Guerrero et al. 2013). However, the absence of a sharp difference between the perception of service performance between the formal and informal indicated that the formal service providers are unable to provide a higher quality of services than the informal service providers.

The irregular rate of waste collection by the service providers in the study area influenced the unwillingness of several households to pay more for improved service delivery. Per the study findings, the majority of the households were not willing to pay more until the rate at which waste is collected from their households had improved. Additionally, the respondents noted their willingness to pay more on condition that, the service providers used advanced tools and logistics to collect their waste as well as improved customer relations. Generally, the people of LaNMMA demonstrated a willingness to pay more for their waste collection. However, they premised their willingness to pay on the regularity of waste collection by service providers, the use of improved waste collection tools and improved customer relations.

5.6 Challenges that Militate Against the Creation of an Enabling Environment for the Private Sector in Waste Management.

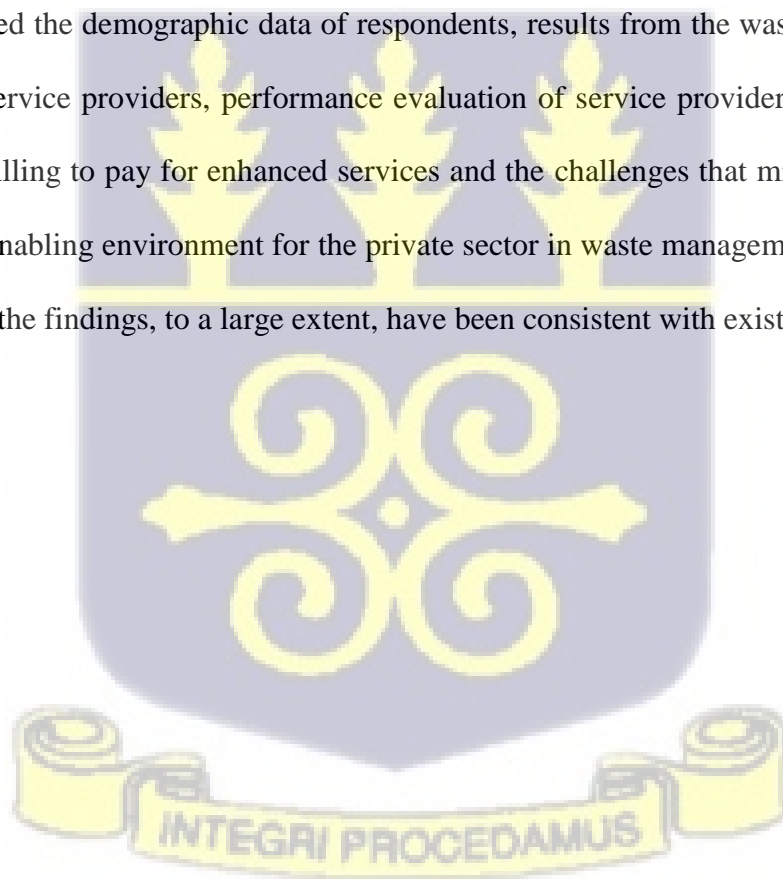
On the militating factors against sustainable waste management by the private sector, from the consumer perspective, a majority of households indicated the inadequacy of service providers as a major challenge. Followed by high cost, unreliable service provision, lack of professionalism, the untidiness of the environment and among other factors. These findings are consistent with those of Monney et al. (2013) and Adu-Boahen et al. (2014), who found that the solid waste management system has numerous obstacles, resulting in low service quality. Similarly, according to MacRae and Rodic (2015), irregularities in solid trash collection lead to waste stacking up in residences, forcing subscribers to resort to burning their waste as a means of avoiding the problem.

On the general challenges facing waste management in the municipality, the most common challenge facing waste disposal in the community is inadequate service providers followed by

high cost of waste management, lack of education and awareness, weak capacity of waste management firms, inadequate landfill disposal sites and inadequate funds and logistics. Finally, though the results indicated that negative attitude and behaviour of people was the least challenge facing waste management in the community, it reaffirms the findings of Monney et al. (2013) that the poor attitude of the public towards sanitation are among the factors that militate against solid waste management.

5.7 Chapter Summary

Chapter Five presented the discussions of generated results presented in Chapter Four. This chapter discussed the demographic data of respondents, results from the waste collection and operations of service providers, performance evaluation of service providers and how much residents are willing to pay for enhanced services and the challenges that militate against the creation of an enabling environment for the private sector in waste management. The analysis has shown that the findings, to a large extent, have been consistent with existing literature.



CHAPTER SIX

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

6.1 Introduction

The study examined the urban solid waste management crisis and how to enhance PPP arrangements in combating the solid waste crises in Ghana. This chapter summarizes the findings of the study in line with the research objectives. It also concludes the study with recommendations and suggests areas for some future research.

6.2 Overview of the study

Following the rapid urbanisation spurred by internal growth and migrations and the concerns of addressing the predicaments faced by private waste management operators, it has become imperative to identify areas that can be improved to strengthen existing partnerships in solid waste management within the La Nkwantanang-Madina Municipality. This research aimed to assess the enabling environment for private sector participation in the management of solid waste in the La Nkwantanang-Madina Municipality. The Municipality was divided into three socioeconomic classes (high, middle and low-income residential sectors) and two communities selected from each classification. These communities were Madina Zongo, Oyarifa, Danfa, North Legon, Pantang and Ayimensah. Given the character of the respondents for this study, two (2) key data collection instruments were used: a questionnaire and an interview guide.

6.3 Summary of Findings

To achieve the goal of the study cleverly, the study addressed four specific objectives as follows:

6.3.1 Assess the arrangement of solid waste management at the La-Nkwantanang-Madina Municipality

The first objective of the study was to evaluate the solid waste management system in the La-Nkwantanang Madina Municipality. The goal was achieved by undertaking a thorough and in-depth interviews on the most likely solid waste management arrangement in the municipality. The interviewees were also asked about the solid waste arrangement in the municipality to validate the various arrangements identified in the literature. According to the findings of the interview, there are clear-cut arrangements for handling solid waste in the municipality but there is a deficit in the application of these arrangements in the management. This is because, though the majority of respondents dispose of their waste using private disposal companies, a few other respondents are burying, burning and using communal dumping sites. With respect to the private waste companies, majority of respondents in the high- and middle-income areas patronize the services of the formal waste companies as against the informal waste companies while the majority of respondents in the low-income areas use the services of the informal collectors. In evaluating the solid waste management system in the La-Nkwantanang Madina Municipality, the findings also revealed that the solid waste management system in the La-Nkwantanang Madina Municipality is that of collection and disposal. The municipality is currently not treating or recycling waste as far as management of waste is concerned.

6.3.2 Assessing the nature of partnership between private service providers and the Municipal Assembly

The study's second goal was to assess the nature of the partnership between service providers and the Municipal Assembly. The tone for achieving this goal was set by a broad and critical literature review of Private Public Partnerships in waste management. Regarding the partnership between service providers and municipalities, the interviewees provided varying

responses. According to the interviewers' responses, LaNMMA, like most municipalities in Ghana, operates a Public-Private Management arrangement in waste management, which is consistent with the extension of market mechanisms of the new public management and decentralization of local services to local governments. According to the findings, the municipal assembly currently engages in the following types of privatizations.

1. Franchise agreement (Formal Contractors)
2. Sanitation Improvement Package (SIP)
3. Pay-as-you-go (Informal contractors)
4. Assembly Collection

There is a share in responsibilities between the private sector (both formal and informal) and the assembly to provide solid waste management services in the municipality. Again, there are some formal private waste collectors who used tricycles, covering almost the entire household waste collection in areas where vehicular movement is a challenge.

6.3.3 Evaluating the performance of service providers and how much households are willing to pay for enhanced services.

The third goal was to evaluate service providers' performance and household willingness to pay for improved services. A four-point criterion was used to assess the performance of solid waste service providers in terms of how households evaluate private waste collectors. Collection rates, logistics, waste collection equipment, customer relations, and charged waste collection fees are examples of these criteria. The study rated solid waste service providers as moderate in terms of providing waste collection, logistics and equipment, as well as the amount charged for waste collection service. Respondents rated the service providers' collection rates and customer relations as fair or average. This implies that majority of households were

generally unhappy with the frequency of services since they do not receive the frequency they require for efficient waste services. Most of the contractors with the exception of Zoomlion Ghana Limited are unable, in most cases, to regularly collect and dispose of solid waste generated in especially low-income areas. Also, the absence of a sharp difference between the perception of service performance between the formal and informal waste collectors indicated that the formal service providers are unable to provide higher quality of services than the informal service providers as expected.

6.3.4 Challenges that militate against the creation of an enabling environment for the private sector in waste management.

In order to accomplish this final objective, a large amount of material on the issues of solid waste management in towns was evaluated. From the findings, majority of the stakeholders identified high costs of solid waste collection, limited and unreliable service providers, lack of professionalism and the untidiness of the surroundings as major challenges with private sector participation in sustainable waste management within the Municipality. It was also discovered that a major challenge that hindered private sector delivery and general participation in waste management within the municipality was inadequate engineered landfill sites. This was followed by high waste management costs, weak capacity of waste management firms, inadequate funds and logistics and poor road networks within the middle- and low-income areas. Finally, the findings revealed that people's negative attitudes and behaviours were the least challenging aspect of waste management in the community.

6.4 Conclusion

The study shed light on urban solid waste management as an issue of concern in the La Nkwantanang-Madina Assembly. A fact which is shared by both the Assembly and residents. Institutional and operational arrangements exist for the management of both household and public waste within the municipality. There seem to be a disconnect in the existence of the arrangement and the application of these arrangement. This is demonstrated by the finding that a proportion of the municipality still use unsustainable means of waste disposal such as burning, burial and disposal in unappropriated places.

Majority of residents surveyed have signed unto household waste services operated by licensed waste management companies. These waste management companies have been given franchise contracts in well-defined designated areas. Their level of service and fees are determined through a consultative or negotiated process with the assembly which monitors and evaluates their performance. Aside this formal arrangement, the remaining households using private waste contractors patronize Bola taxis, aboboyaa and other forms of unlicensed household waste collections.

There is a general dissatisfaction by the licenced waste management services providers. The service was rated moderate by a large proportion of the household respondents. This is as a result of the frequency of the collection of waste by these private collectors. With a large number of household respondents reporting that their bins are not emptied once a week as expected leading to the adoption of unauthorised waste disposal methods such as burning and burring as well as the untidiness of their environment. Which may lead to outbreaks of environmental-related diseases such as Malaria.

The municipality lacks all the elements of contemporary sustainable waste management ranging from collection to final disposal. Based on discussions with officials of the

municipality lacks a final disposal site while recycling is limited to the efforts of a few small-scale private operators. Though there is an intention to reach waste separation, this has not been achieved based on the data collected and documents reviewed. The municipality is currently not treating or recycling waste as far as the management of waste is concerned. In all, the assembly lacks the capacity to deliver sustainable waste management. Even though there is a national policy document supporting the delivery of sustainable waste management, the translation of the goals and objectives of the policy has not been complete. There are many deficits in both the institutional arrangement and financial resources. There are also shortcomings in the equipment and tools required to efficiently deliver sustainable waste management. One of the key findings was the discovery that the municipality does not have a final disposal site which is a critical element in waste management. The enabling environment required for effective private sector participation in the delivery of sustainable waste management is challenged. At the national level, there is limited financial support for investors in private waste management services while key elements of financial sustainability such as franchise fees and service fees seem inadequate to cover their operations and investment.

6.5 Recommendation

Given the findings and the conclusion drawn above, this study makes the following recommendations.

- **Lack of final disposal sites**

Government as part of its role in providing an enabling environment for effective and efficient private sector participation in solid waste management should increase investment in final disposal sites and transfer stations which are easy to access. Innovative waste management

approaches that make use of transfer stations and high-capacity compaction tracts have to be made a key part of the waste management strategy of MMDAs.

- **weak capacity of institutions to deliver sustainable waste management**

Enhance the capacity of practitioners across board to research, educate and innovate for sustainable waste management. Fund for waste management innovation and research to be set up by both the government and private players to produce new innovative ways of managing waste. Government must make deliberate efforts to link research output to practice in the sanitation sector.

- **Reduce the use of unsustainable means of waste disposal**

Enhance the capacity of local government entities to regulate and enforce sanitation laws and bye-laws. Technical and financial capacities of MMDAs must be enhanced to enable them handle the immerging complexities in waste management.

- **Outdated National Sanitation Policy**

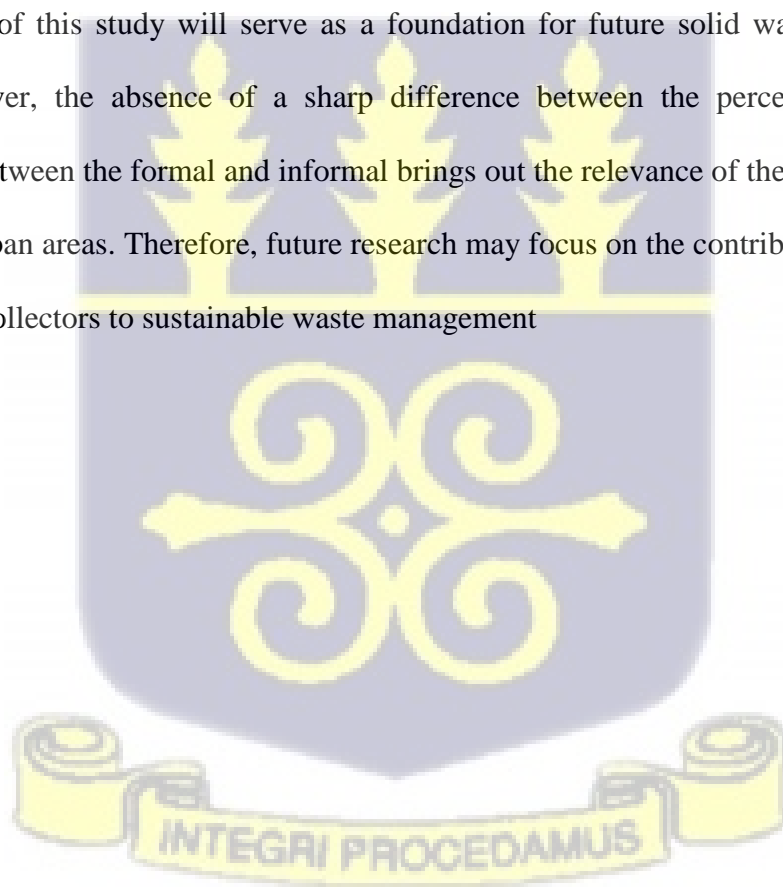
Policies, laws and regulations on solid waste management must be updated, reviewed and revised to take account of current waste management conditions. The last updated NESSAP was in 2010. The waste management landscape has changed significantly, reflecting new realities. An updated NESSAP will account for these new realities and better situate the increasing role of private sector operators in waste management in large cities like Accra, Kumasi and Takoradi. This will ensure all authorities responsible for increasing the efficiency and effectiveness of their services are strengthened methodically and also lead to the coordination and collaboration of all waste agencies' efforts to improve waste management and environmental protection.

- **Limited financial support for investors in private waste management services**

Promote investment in waste management logistics and equipment through fiscal incentives and targeted policies. Fiscal incentives such as subsidies, tax holidays and financing options have to be created by the government to enable private sector players access financing required to invest in waste management. An updated financing model has to be articulated in the revised NESSAP to provide the required framework for financing waste management in light of the increasing role of private operators.

6.6 Future Research

The outcomes of this study will serve as a foundation for future solid waste management studies. However, the absence of a sharp difference between the perception of service performance between the formal and informal brings out the relevance of the informal service providers in urban areas. Therefore, future research may focus on the contribution of informal private waste collectors to sustainable waste management



REFERENCES

- Abdel-Shafy, H. I., & Mansour, M. S. (2018). Solid waste issue: Sources, composition, disposal, recycling, and valorization. *Egyptian journal of petroleum*, 27(4), 1275-1290.
- Acharya, A. S., Prakash, A., Saxena, P., & Nigam, A. (2013). Sampling: Why and how of it. *Indian Journal of Medical Specialties*, 4(2), 330-333.
- Ackoff, R. L. (1971). Towards a system of systems concepts. *Management Science*, 17(11), 661-671.
- Adams, E. A., Otooa, R., Boateng, D., & Baffuor, P. A. (2014). Waste Management Services Utilization among Households in the Kumasi Metropolis, Ghana. *International Journal of Community Development*, 2(2), 23-29.
- Addaney, M., & Oppong, R. A. (2015). Critical issues of municipal solid waste management in Ghana. *Jenrm*, 2(1), 30-36.
- Adu-Boahen, K., Atampugre, G., Antwi, K.B., Osman, A., Osei, K.N., Mensah, E.A. and Adu-Boahen, A.O., (2014). Waste management practices in Ghana: challenges and prospect, Jukwa Central Region. *International Journal of Development and Sustainability*, 3(3), 530-546.
- Altenburg, T., & Von Drachenfels, C. (2007). Creating an enabling business environment in Asia: To what extent is public support warranted? (No. 2/2007). Discussion Paper, ISBN 978-3-88985-334-9, Deutsches Institut für Entwicklungspolitik (DIE), Bonn.
- Ameyaw, E. E. & Chan, A. P. (2015) Evaluation and ranking of risk factors in public-private partnership water supply projects in developing countries using fuzzy synthetic evaluation approach. *Expert System Application*, 42(12):5102-5116
- Ameyaw, E. E., & Chan, A. P. (2013). Identifying public-private partnership (PPP) risks in managing water supply projects in Ghana. *Journal of Facilities Management*, 11 (2):152-182

- Anton, E. (2017). Infrastructure Regulation in Developing Countries: An Exploration of Hybrid and Transitional Models, Working Paper No.4, World Bank
- Appiah-Effah, E., Duku, G. A., Azangbego, N. Y., Aggrey, R. K. A., Gyapong-Korsah, B., & Nyarko, K. B. (2019). Ghana's post-MDGs sanitation situation: an overview. *Journal of Water, Sanitation and Hygiene for Development*, 9(3), 397-415.
- Asase, M., Yanful, E.K., Mensah, M., Stanford, J. and Amponsah, S., (2009). Comparison of municipal solid waste management systems in Canada and Ghana: A case study of the cities of London, Ontario, and Kumasi, Ghana. *Waste Management*, 29(10), 2779-2786.
- Asare, B.E. & Frimpong, M.K. (2013) Public-private partnerships and urban sanitation: do expectations meet realities in Madina-Ghana? *Journal of African Studies and Development*, 5(5):113-124.
- Asomani-Boateng, R. (2007). Closing the loop: community-based organic solid waste recycling, urban gardening, and land use planning in Ghana, West Africa. *Journal of Planning Education and Research*, 27(2), 132-145.
- Austin, J. E., & Seitanidi, M. M. (2012). Collaborative value creation: A review of partnering between non-profits and businesses: Part 2. Value creation spectrum and collaboration stages. *Non-profit and Voluntary Sector Quarterly*, 41(5):759-798.
- Awortwi, N. (2004). Getting the fundamentals wrong: woes of public-private partnerships in solid waste collection in three Ghanaian cities. *Public Administration and Development: The International Journal of Management Research and Practice*, 24(3), 213-224.
- Barkemeyer, R., Holt, D., Preuss, L., & Tsang, S. (2014). What happened to the 'development' in sustainable development? Business guidelines two decades after Brundtland. *Sustainable Development*, 22(1), 15-32.

- Baud, I.S.A. & Post J. (2002). New partnership in urban solid waste management in the developing world and their contribution to sustainable development: experiences in Accra (Ghana) and Chennai (India). In: Baud I.S.A., Dietz A.J., de Hann L.J. & Post J. (eds) *Re- Aligning Government, Civil Society and the Market: New Challenges in Urban and Regional Development, Essays in Honour of G.A. de Bruijne*. Amsterdam: AGIDS, 131–150.
- Bell, J., & Waters, S. (2018). Ebook: doing your research project: a guide for first-time researchers. McGraw-hill education (UK).
- Berman, P., Kendall, C., & Bhattacharyya, K. (1994). The household production of health: integrating social science perspectives on micro-level health determinants. *Social Science & Medicine*, 38(2), 205-215.
- von Bertalanffy L. (1951). Theoretical Models in Biology and Psychology. *Journal of Personality*. 20, 24–38. doi: 10.1111/JOPY.1951.20
- Biesta, G. J. (2010). Why ‘what works’ still won’t work: From evidence-based education to value-based education. *Studies in philosophy and education*, 29(5), 491-503.
- Boadi, K.O. and Kuitunen, M. (2003) Municipal Solid Waste Management in the Accra Metropolitan Area, Ghana. *The Environmentalist*, 23, 211-218.
- Boateng, S., Amoako, P., Appiah, D.O., Poku, A.A. and Garsonu, E.K., (2016). Comparative analysis of household’s solid waste management in rural and urban Ghana. *Journal of Environmental and Public Health*, 2016. doi: 10.1155/2016/5780258
- Brinkerhoff, D. W., & Brinkerhoff, J. M. (2011). Public–private partnerships: Perspectives on purposes, publicness, and good governance. *Public Administration and Development*, 31(1), 2-14.
- Bryman, A. (2008) Social research methods. *Australian Journal of Business and Management Research*, 1 (5):41-50.

- Buertey, A. K. (2018). Mobile Phone Recycling and Reuse in the Accra Metropolis: Prospects and Challenges (Doctoral dissertation, University of Ghana).
- Bugge, M. M., Fevolden, A. M., & Klitkou, A. (2019). Governance for system optimization and system change: The case of urban waste. *Research Policy*, 48(4), 1076-1090.
- Cerny, P. G., Menz, G., & Soederberg, S. (2005). Different roads to globalization: Neoliberalism, the competition state, and politics in a more open world. In *Internalizing globalization* (pp. 1-30). Palgrave Macmillan, London.
- Clarke, A., & Fuller, M. (2010). Collaborative strategic management: Strategy formulation and implementation by multi-organizational cross-sector social partnerships. *Journal of Business Ethics*, 94, 85-101.
- Cointreau-Levine, S. (1994). Private sector participation in municipal solid waste services in developing countries (Vol. 1). Washington DC, USA: World Bank.
- Creswell, J. W. (2003). A framework for design. *Research design: Qualitative, quantitative, and Mixed Methods Approaches*, 9-11.
- Creswell, J. W., Shope, R., Plano Clark, V. L., & Green, D. O. (2006). How interpretive qualitative research extends mixed methods research. *Research in the Schools*, 13(1), 1-11.
- Creswell, J. W. (2009). Mapping the field of mixed methods research. *Journal of Mixed Methods Research*, 3(2), 95-108.
- Creswell, J. W. (2014). *A concise introduction to mixed methods research*. SAGE publications.
- Creswell, J. W., & Plano Clark, V. L. (2011). Choosing a mixed methods design. *Designing and conducting mixed methods research*, 2, 53-106.

- Daddi, T., Testa, F., Frey, M., & Iraldo, F. (2016). Exploring the link between institutional pressures and environmental management systems effectiveness: An empirical study. *Journal of environmental management*, 183, 647-656.
- Daramola, A., & Ibe, E. O. (2010). Urban environmental problems in Nigeria: Implications for sustainable development. *Journal of Sustainable Development in Africa*, 12(1), 124-145.
- Delmon, J. (2010) Understanding Options for Private-Partnership Partnerships in Infrastructure, Policy Research Working Paper 5173, World Bank
- Donaldson, D. & Wagle, D. (2015) Privatisation: principles and practices. Washington D. C., World Bank.
- Dos Santos, S., Adams, E. A., Neville, G., Wada, Y., De Sherbinin, A., Bernhardt, E. M., & Adamo, S. B. (2017). Urban growth and water access in sub-Saharan Africa: Progress, challenges, and emerging research directions. *Science of the Total Environment*, 607, 497-508.
- Downmore, M., Shepherd, M., Andrew, M. and Daniel, N.B.J., (2011). Municipality solid waste (MSW) management challenges of Chinhoyi town in Zimbabwe: Opportunities of waste reduction and recycling. *Journal of Sustainable Development in Africa*, 13(2), 170-177.
- Driscoll, D. L. (2011). Introduction to primary research: Observations, surveys, and interviews. *Writing spaces: Readings on Writing*, 2, 153-174.
- El-Haggar, S. M. (2017) Sustainable industrial design and waste management: Cradle-to-cradle for sustainable development (p. 424). Oxford: Elsevier/Academic Press.
- Eurostat (2019) Waste Statistics Explained. Brussel. European Union.
- Farquharson, T. M. & Yescombe, E. (2011) How to Engage with the Private Sector in Public-Private Partnerships in Emerging Markets, World Bank/PPIAF

- Fei-Baffoe, B., Nyankson, E. A., & Gorkeh-Miah, J. (2014). Municipal solid waste management in Sekondi-Takoradi metropolis, Ghana. *Journal of Waste Management*, 2014, 1-8.
- Fobil, J. N., Armah, N. A., Hogarh, J. N., & Carboo, D. (2008). The influence of institutions and organizations on urban waste collection systems: an analysis of waste collection system in Accra, Ghana (1985e2000). *Journal of Environmental Management*, 86(1), 262-271.
- Ghana Statistical Service (2014) 2010 Population and Housing Census Report. Accra. Ghana Statistical Service
- Ghana Statistical Service (2014). 2010 Population and Housing Census report. Urbanisation. Accra.
- Ghana Statistical Service (2014) 2010 Population and Housing Census (District Analytical Report: La Nkwantanang-Madina Municipality). Accra. GSS.
- Ghana Statistical Service (2022) 2021 Population and Housing Census: Population of Regions and District (Vol. 3A). Accra. GSS.
- Gomez, B. and Jones, P.J. (2010). *Research methods in Geography*. John Wiley & Sons Ltd.
- Googins, Bradley K., and Steven A. Rochlin. 2000. "Creating the Partnership Society: Understanding the Rhetoric and Reality of Cross-Sectoral Partnerships." *Business and Society Review* 105 (1): 127-44.
- Gould, M. S., Greenberg, T. E. D., Velting, D. M., & Shaffer, D. (2003). Youth suicide risk and preventive interventions: a review of the past 10 years. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42(4), 386-405.
- Guerrero, L. A., Maas, G., & Hogland, W. (2013). Solid waste management challenges for cities in developing countries. *Waste Management*, 33(1), 220-232.

- Gyimah, P., Mariwah, S., Antwi, K.B. and Ansah-Mensah, K., (2021). Households' solid waste separation practices in the Cape Coast Metropolitan area, Ghana. *GeoJournal*, 86(2), 567-583.
- Harvey, D. (2007). *A brief history of neoliberalism*. Oxford University Press, USA.
- Hazra, T., & Goel, S. (2009) Solid waste management in Kolkata, India: Practices and challenges. *Waste Management*, 29(1): 470-478.
- Hettiarachchi, H., Ryu, S., Caucci, S., & Silva, R. (2018). Municipal solid waste management in Latin America and the Caribbean: Issues and potential solutions from the governance perspective. *Recycling*, 3(2), 1-15.
- Hoornweg, D., & Bhada-Tata, P. (2012). What a waste: a global review of solid waste management.
- Hotor, S. M. (2017). *Assessment of Knowledge, Attitudes and Practices of Sanitation and Health of Market Users at the Agbogbloshie Market in Accra, Ghana* (Doctoral dissertation, University of Ghana).
- Huber, M., van Vliet, M., Giezenberg, M., Winkens, B., Heerkens, Y., Dagnelie, P. C., & Knottnerus, J. A. (2016). Towards a 'patient-centred' operationalisation of the new dynamic concept of health: a mixed methods study. *BMJ open*, 6(1), doi: 10.1136/bmjopen-2015-010091.
- Hutchison, R. (2016) Successfully privatising solid waste services. In: Proceedings of SWANA's 6th national source book on environmental sound technologies for municipal solid waste management. International Environmental Technology Center.
- Ian, A. (2017) improving the Balance between Regulatory Independence, Accountability, Decision-making and Performance. Paper prepared for 4th Annual Forum of Utility Regulators (AFUR) Conference, Livingstone, Zambia

- Idowu, O. O. (2013). Challenges of urbanization and urban growth in Nigeria. *American Journal of Sustainable Cities and Society*, 2(1), 79-94.
- Ilić, M., & Nikolić, M. (2016). Drivers for development of circular economy—A case study of Serbia. *Habitat International*, 56, 191-200.
- International Labor Organization (2014). An enabling environment for sustainable enterprises. Geneva, ILO.
- ISSER. (2012). Institute of Statistical, Social and Economic Research). Ghana Social Development Outlook, 2012, University of Ghana. Accra.
- Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field methods*, 18(1), 3-20.
- Jarup, L., Morris, S., Richardson, S., Briggs, D. & Cobley, N. (2014). Down syndrome in birth near landfill sites. *Prenatal Diagnosis*, 27(13):1191-1196
- Johnson, B. (2014). Ethical issues in shadowing research. *Qualitative Research in Organizations and Management*, 9 (1), 21-40.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher*, 33(7), 14-26.
- Jong, Y. O., & Jung, C. K. (2015). The Development of Interview Techniques in Language Studies: Facilitating the Researchers' Views on Interactive Encounters. *English Language Teaching*, 8(7), 30-39.
- Karak, T., Bhagat, R. M., & Bhattacharyya, P. (2012). Municipal solid waste generation, composition, and management: the world scenario. *Critical Reviews in Environmental Science and Technology*, 42(15), 1509-1630.
- Karanja A., (2002). Solid waste management in Nairobi: actors, institutional arrangements and contribution to sustainable development. PhD Dissertation, ISS.

- Ke, Y., Wang, S., Chan, A. P. & Lam, P. T. (2010). Preferred risk allocation in China's public-private partnership (PPP) projects. *International Journal of Project Management*, 28(5):482-492
- Kpessa, M., Béland, D., & Lecours, A. (2011). Nationalism, development, and social policy: The politics of nation-building in sub-Saharan Africa. *Ethnic and Racial Studies*, 34(12), 2115-2133.
- Krosnick, J. A. (2018). Questionnaire design. In *The Palgrave handbook of survey research* (439-455). Palgrave Macmillan, Cham.
- Kubanza, N. S., & Simatele, D. (2018). Sustainable solid waste management in sub-Saharan African cities: application of system thinking and system dynamic as methodological imperatives in Kinshasa, the Democratic Republic of Congo. *Local Environment*, 23(2), 220-238.
- Küblböck, K., & Staritz, C. (2014). Private sector development: Business plan or development strategy? (No. 51). ÖFSE Working Paper.
- Kurian, J. (2006). Stakeholder participation for sustainable waste management. *Habitat International*, 30(4):863-871
- Kwak, Y. H., Chih, Y., & Ibbs, C. W. (2009). Towards a comprehensive understanding of public private partnerships for infrastructure development. *California Management Review*, 51(2), 51-78.
- Laner, D., Crest, M., Sharff, H., Morris, J.W.F. & Barlaz, M.A. (2012) A review of approaches for the long-term management of municipal solid waste landfills. *Waste Management*, 32, 498-512.
- Larner, W. (2000). Neo-liberalism: Policy, ideology, governmentality. *Studies in Political Economy*, 63(1), 5-25.

- La Nkwantanang-Madina Municipal Assembly (2018) Medium Term Development Plan 2018-2021. Accra. LaNMMA.
- La Nkwantanang-Madina Municipal Assembly (2022) Medium Term Development Plan 2022-2025. Accra. LaNMMA.
- Leiva, F. I. (2008). Toward a critique of Latin American neostructuralism. *Latin American Politics and Society*, 50(4), 1-25.
- Lilja, R. (2016). *Promoting waste prevention in industry – search for policy instruments*. Doctoral Dissertation. Espoo, Finland: Aalto University School of Chemical Technology [published].
- Liyala, C. M. (2011). *Modernising solid waste management at municipal level: Institutional arrangements in urban centres of East Africa* (Vol. 3). Wageningen Academic Publishers.
- MacRae, G., & Rodic, L. (2015). The weak link in waste management in tropical Asia? Solid waste collection in Bali. *Habitat International*, 50, 310-316.
- Madu, C.N. (2017) Environmental Planning and Management. Retrieved on 15/10/2019 from <http://site.ebrary.com.libproxy.aalto.fi/lib/aalto/reader.action?docID=10188841>
- Mahalingam, A., Devkar, G. A., & Kalidindi, S. N. (2011). A comparative analysis of public-private partnership (PPP) coordination agencies in India: What works and what doesn't. *Public Works Management & Policy*, 16(4), 341-372.
- Mansur, A. V., Brondízio, E. S., Roy, S., Hetrick, S., Vogt, N. D., & Newton, A. (2016). An assessment of urban vulnerability in the Amazon Delta and Estuary: a multi-criterion index of flood exposure, socio-economic conditions and infrastructure. *Sustainability Science*, 11(4), 625-643.

- Marshall, R. (2013). A systems approach to community engaged integrated solid waste management in Todos Santos Cuchumatán, Guatemala (Doctoral dissertation, University of Guelph).
- Marshall, R. E., & Farahbakhsh, K. (2013). Systems approaches to integrated solid waste management in developing countries. *Waste Management*, 33(4), 988-1003.
- Martino, S. C., Shaller, D., Schlesinger, M., Parker, A. M., Rybowski, L., Grob, R., ... & Finucane, M. L. (2017). CAHPS and comments: how closed-ended survey questions and narrative accounts interact in the assessment of patient experience. *Journal of Patient Experience*, 4(1), 37-45.
- Matsuda, M., Suzuki, H & Kimura, F. (2012) Evaluation of Used-Parts Quality for Integration of the Inverse Manufacturing Process. In: Kovács, G.L., Bertók, P. & Haidegger, G. *Digital Enterprise Challenges*. Place of publication. Springer US. 152-163.
- Mattiello, A., Chiodini, P., Bianco, E., Forgiione, N. & Flammia, I, Gallo C et al. (2013). Health effects associated with the disposal of solid waste in landfills and incinerators in populations living in surrounding areas: a systematic review. *International Journal of Public Health*, 58(5):725–35.
- Maxcy, S. J. (2003). Pragmatic threads in mixed methods research in the social sciences: The search for multiple modes of inquiry and the end of the philosophy of formalism. *Handbook of mixed methods in social and behavioral research*, 51-89.
- McBean, E.A., Rosso, E. & Rovers, F.A. (2015) Improvement in financing for sustainability in solid waste management. *Journal of Resources, Conservation and Recycling*. 43, 391– 401.
- McGrath, M. (2016) Fish eat plastic like teens eat fast food, researchers say. Retrieved on 15/10/2019 from <http://www.bbc.com/news/science-environment>.

- Metin, E., Erzturk, A. & Neyim, C. (2013) Solid waste management practices and review of recovery and recycling operations in Turkey. *Waste Management*. 23(5), 425–432.
- Miezah, K., Obiri-Danso, K., Kádár, Z., Fei-Baffoe, B., & Mensah, M. Y. (2015). Municipal solid waste characterization and quantification as a measure towards effective waste management in Ghana. *Waste Management*, 46, 15-27.
- Minghua, Z., Xiumin, F., Rovetta, A., Qichang, H., Vicentini, F., Bingkai, L., ... & Yi, L. (2009). Municipal solid waste management in Pudong new area, China. *Waste Management*, 29(3), 1227-1233.
- Monney, I., Tiimub, B.M. and Bagah, H.C., (2013). Characteristics and management of household solid waste in urban areas in Ghana: the case of WA. *Civil and Environmental Research*, 3(9), 10-21.
- Moore, S. A. (2012) Garbage matters: Concepts in new geographies of waste. *Progress in Human Geography*. 36(6), 780-799
- Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1(1), 48-76.
- Moser, A., & Korstjens, I. (2018). Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *European Journal of General Practice*, 24(1), 9-18.
- Murray, A., Skene, K. & Haynes, K. (2017). The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context. *Journal of Business Ethics*, 140(3), 369-380.
- Myers, J. L., Well, A. D., & Lorch Jr, R. F. (2013). *Research design and statistical analysis*. Routledge.

- Nelson, G. (2008). *Beyond Earth Day: Fulfilling the Promise*. Madison, WI: University of Wisconsin Press.
- Nwali, A. C., Johnson, N., & Oganezi, B. (2019). Privatisation of public enterprises in Nigeria: Challenges and prospects on economic development. *Mediterranean Journal of Social Sciences*, 10(4), 131-131.
- Oduro-Kwarteng, S. & Dijk, V.M.P. (2013). The effect of increased private sector involvement in solid waste collection in five cities in Ghana. *Waste Management & Research*, 31(10): 810–93
- Oduro-Kwarteng, S. (2011). *Private Sector Involvement in Urban Solid Waste Collection: UNESCO-IHE PhD Thesis*. CRC Press.
- Ojeda-Benitez, S., de Vega, C. A. & Ramirez-Barreto, M.E. (2013). Characterization and quantification of household solid wastes in a Mexican city. *Resource Conservation and Recycling*. 39, 211–222.
- Olukanni, D. O., & Nwafor, C. O. (2019). Public-private sector involvement in providing efficient solid waste management services in Nigeria. *Recycling*, 4(2), 1-9.
- Opong, A. T. K. (2016). *Collection and disposal of solid waste by private companies in Ghana: A Case of Zoomlion Ghana Limited in the Sunyani Municipality*. Master of Arts in Development Studies. International Institute of Social Studies.
- Organization for Economic Cooperation and Development (2017). *Development Co-operation for Private Sector Development: Analytical Framework and Measuring Official Development Finance*. Paris, OECD.
- Oteng-Ababio, M. (2007) *Private–Public Partnership in solid waste management in the Greater Accra Metropolitan Area*. Dissertation, University of Ghana, Legon.

- Oteng-Ababio, M. (2011) Beyond technical details: The stalled Kwabenya Engineered Sanitary Landfill Project in Accra, Ghana. *Danish Journal of Geography*, (2),111-126
- Oteng-Ababio, M. (2011). Governance Crisis or Attitudinal Challenges: Collection, Storage and Transportation of Solid Waste in Ghana. In *Integrated Waste Management Volume 1*. Sunil Kumar (ed.), ISBN 978-953-307-469-6. Intech Open Access Publishers, Croatia. Pg 3-22
- Oteng-Ababio, M. (2010). Private Sector Involvement in Solid Waste Management in Ghana: The Case of the Greater Accra Metropolitan Area (GAMA). *Waste Management and Research* 28: 322-329.
- Oteng-Ababio, M., Melara Arguello, J. E. & Gabbay, O. (2013) Solid waste management in African cities: Sorting the facts from the fads in Accra, Ghana. *Habitat International*, 39: 96-104.
- Oteng-Ababio, M. (2014) Rethinking waste as a resource: insights from a low-income community in Accra, Ghana. *City, Territory and Architecture*, 1(10): 1-14.
- Oteng-Ababio, M. and Melara, J.E.A. (2014). Paradigm of Mediocrity: Poverty and Risk Accumulation in Urban Africa – The Case of Korle Gonno, Accra. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 7(1): 45-61.
- Owusu, G. (2010). Social effects of poor sanitation and waste management on poor urban communities: A neighbourhood-specific study of Sabon Zongo, Accra. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 3(2), 145-160.
- Owusu-Sekyere, E., Ossman, I. K. & Abdul, Y. K. (2013). Waste and Wealth Linkages in the Kumasi Metropolitan Area. *International Journal of Current Research*, 12(2), 123-138

- Owusu-Sekyere, E. (2014). Scavenging for Wealth or Death? Exploring the health risk associated with waste scavenging in Kumasi, *Ghana Journal of Geograph*, 6, 63 – 80
- Pfeffer, Jeffrey and Salancik, Gerald R., (1978). The External Control of Organizations: A Resource Dependence Perspective. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship, Available at SSRN: <https://ssrn.com/abstract=1496213>
- Pires, A., Martinho, G. & Chang, N.B. (2011) Solid waste management in European countries: A review of systems analysis techniques. *Journal of Environmental Management*. 92, 1033-1050
- Popping, R. (2015). Analyzing open-ended questions by means of text analysis procedures. *Bulletin of Sociological Methodology*, 128(1), 23-39.
- Porta, D., Milani, S., Lazzarino, A. I., Perucci, C. A. & Forastiere, F. (2010) Systematic review of epidemiological studies on health effects associated with management of solid waste. *Environmental Health*, 8:60-75. doi:10.1186/1476-069X-8-60.
- Post, J. (1999). The problems and potentials of privatising solid waste management in Kumasi, Ghana. *Habitat International*, 23, 201–215.
- Puopiel, F. (2010). Solid Waste Management in Ghana: The case of Tamale Metropolitan Area. MSC Thesis, KNUST.
- Ramanadham, V. V. (2011) The economics of public enterprise. London. Routledge.
- Rea, L. M., & Parker, R. A. (2014). Designing and conducting survey research: A comprehensive guide. John Wiley & Sons.
- Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences*, 6(2), 1-5.

- Ribić, B., Voća, N., & Ilakovac, B. (2017). Concept of sustainable waste management in the city of Zagreb: Towards the implementation of circular economy approach. *Journal of the Air & Waste Management Association*, 67(2), 241-259.
- Rodić, L., & Wilson, D. C. (2017). Resolving governance issues to achieve priority sustainable development goals related to solid waste management in developing countries. *Sustainability*, 9(3), 1-18.
- Rodrik, D. (2004). Industrial policy for the twenty-first century. Available at SSRN 666808.
- Romvall, K., Kurdve, M., Bellgran, M. & Wictorsson, J. (2011) 'Green Performance Map – An Industrial Tool for Enhancing Environmental Improvements within a Production System.' In: Proceedings of the 18th CIRP International 353 Conference on Life Cycle Engineering; Braunschweig, Germany: 2-4 May. Berlin, Heidelberg: Springer. 353-358.
- Sarkis, J. (2011) Manufacturing's role in corporate environmental sustainability Concerns for the new millennium. *International Journal of Operations & Production Management*. 21 (5), 666-686
- Schluep, M. (2010) E-waste management in developing countries—With a focus on Africa. ITU Symposium on ICTs and the Environment & Climate Change. Cairo
- Seadon, J. K. (2010). Sustainable waste management systems. *Journal of Cleaner Production*, 18(16-17), 1639-1651.
- Shankar, B. (2017) Assessment Study of Private Sector Engagement in Climate Relevant Activities in Nepal. Paris. UNEP
- Sharma, G. (2017). Pros and cons of different sampling techniques. *International Journal of Applied Research*, 3(7), 749-752.

- Shekdar, A. V. (2009). Sustainable solid waste management: An integrated approach for Asian countries. *Waste Management*, 29(4), 1438-1448.
- Simon, A., Sohal, A., & Brown, A. (1996). Generative and case study research in quality management: Part I: theoretical considerations. *International Journal of Quality & Reliability Management*, 13(1), 32-42
- Singh, A. S., & Masuku, M. B. (2014). Sampling techniques & determination of sample size in applied statistics research: An overview. *International Journal of economics, commerce and management*, 2(11), 1-22.
- Singh, R. P., Singh, P., Araujo, A. S., Ibrahim, M. H., & Sulaiman, O. (2011). Management of urban solid waste: Vermicomposting a sustainable option. *Resources, Conservation and Recycling*, 55(7), 719-729.
- Songsore J., 2003. Towards a better understanding of Urban Change: Urbanisation, National Development and Inequality in Ghana. Ghana Universities Press.
- Spoann, V., Fujiwara, T., Seng, B., Lay, C., & Yim, M. (2019). Assessment of public–private partnership in municipal solid waste management in Phnom Penh, Cambodia. *Sustainability*, 11(5), 1-19.
- Tashakkori, A., Teddlie, C., & Teddlie, C. B. (1998). Mixed methodology: *Combining qualitative and quantitative approaches* (46). Sage.
- Tashakkori, A., & Teddlie, C. (2009). Integrating qualitative and quantitative approaches to research. *The SAGE Handbook of Applied Social Research Methods*, 2, 283-317.
- Tchobanoglous, G. & Kreith, F. (2012) Handbook of solid waste management (2nd ed., p. 950). McGraw-Hill
- Tchobanoglous, G., Burton, F. L., & Stensel, H. D. (2003). Wastewater Engineering: Treatment and Reuse. McGraw-Hill, Inc, New York, USA.

- Tennberg, M., Vola, J., Espiritu, A. A., Fors, B. S., Ejdemo, T., Riabova, L., & Nosova, T. (2014). Neoliberal governance, sustainable development and local communities in the Barents Region. *Peoples, Economies and Politics*, 1(1), 41-47
- Tewksbury, R. (2012). Qualitative methodology. In *The Routledge Handbook of Deviant Behavior*, 75-81. Routledge.
- Thomas, G. (2011). A typology for the case study in social science following a review of definition, discourse, and structure. *Qualitative inquiry*, 17(6), 511-521.
- Tonci, B., Bernard, T. & Fiona, W. (2013). Regulation by Contract: A New Way to Privatize Electricity Distribution. World Bank Working Paper 14
- UN-Habitat (2013). State of the World's Cities 2012/2013: Prosperity of Cities. Retrieved from: <https://sustainabledevelopment.un.org/content/documents/745habitat.pdf>
- UN-Habitat (2014). State of the World's Cities 2013/2014: Re-imagining Sustainable Urban Transitions. Retrieved from https://www.gwp.org/globalassets/global/toolbox/references/the-state-of-african-cities-2014_re-imagining-sustainable-urban-transitions-un-habitat-2014.pdf
- Van Den Hurk, M., & Verhoest, K. (2016). The challenge of using standard contracts in public-private partnerships. *Public Management Review*, 18(2), 278-299.
- Vartanian, T. P. (2010). Secondary data analysis. *Oxford University Press*, 9-12
- Vergara, S. E., & Tchobanoglous, G. (2012). Municipal solid waste and the environment: a global perspective. *Annual Review of Environment and Resources*, 37, 277-309.
- Waltner-Toews, D., Kay, J. J., & Lister, N. M. E. (Eds.). (2008). *The ecosystem approach: Complexity, uncertainty, and managing for sustainability*. Columbia University Press.
- West, P. W. (2016). Simple random sampling of individual items in the absence of a sampling frame that lists the individuals. *New Zealand journal of forestry science*, 46(1), 1-7.

- Woodard & Curran Inc. (2016) *Industrial waste treatment handbook* (2nd ed., p. 532). Oxford: Elsevier
- World Bank (2010). *City of Accra, Ghana, Consultative Citizens' Report Card*. World Bank: Washington, D.C.
- Wright, P. M., & Irwin, C. (2018). Using systematic observation to assess teacher effectiveness promoting personally and socially responsible behavior in physical education. *Measurement in Physical Education and Exercise Science*, 22(3), 250-262.
- Yescombe, E. R. (2013) *Public-Private Partnerships: Principles of Policy and Finance*, 2nd edition, Elsevier Science, Oxford.
- Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education*, 48(2), 311-325.
- Yin, R. K. (2003). Designing case studies. *Qualitative research methods*, 5(14), 359-386.
- Yoda, R. M., Chirawurah, D., & Adongo, P. B. (2014). Domestic waste disposal practice and perceptions of private sector waste management in urban Accra. *BMC Public Health*, 14(1), 1-10.
- Yong, H. K. (2010) *Public-Private Partnerships Policy and Practice: A Reference Guide*, London: Commonwealth Secretariat
- Załoksnis, J. (2018) *Solid Waste Management*. Chennai, Department of Waste Management - Indian Institute of Technology
- Zarate, M. A., Slotnick, J., & Ramos, M. (2008). Capacity building in rural Guatemala by implementing a solid waste management program. *Waste Management*, 28(12), 2542-2551.

Ziai, A. (2016). The World Bank Inspection Panel in Ghana: Civil Society Protest and the Glocalization of Accountability. *Journal of Poverty Alleviation & International Development*, 7(1), 40-65



APPENDIXES

Appendix A

QUESTIONNAIRE FOR HOUSEHOLDS

This questionnaire seeks to collect relevant primary data for the conduct of an academic exercise on the topic **“URBAN SOLID WASTE MANAGEMENT CRISES: AN ASSESSMENT OF THE ENABLING ENVIRONMENT FOR PRIVATE SECTOR PARTICIPATION”** towards the award of Master’s Degree in Geography and Resource Development from the University of Ghana. The purpose of this study is to assess the roles of all stakeholders in the creation of an enabling environment for private sector involvement in sustainable solid waste management. All data collected will be treated with maximum confidentiality and would be solely used for academic purposes. Your support and contribution would be very much appreciated. Thank you.

Background of respondents

1. Age of respondents
2. Sex of respondents
 1. Male () 2. Female ()
- 3.. Highest level of education of respondents
 1. None () 2. Primary () 3. JHS/Middle () 4. SHS () 5. Voc/Tech () 6. Tertiary ()
 7. Non formal () 8. Others specify.....
4. What is your average monthly household income (in Ghana cedis - GhC)?
 1. 1 – 500 () 2. 501 – 1,000 () 3. 1,001 – 1,500 ()
 4. 1,501-2000 () 5. 2,001-2,500 () 6. Above 2,500 ()

5. If employed, what sector are you employed in?

1. Service/Commerce () 2. Industry () 3. Agriculture () 4. Public service ()
5. Unemployed () 6. Others, specify.....

Waste collection and operations of service providers

6. Which of the following types of waste do you generate in your household? (you can select more than one answer)

Food waste () Plastic waste () Ashes () Others, specify:

7. How do you store your household waste?

1. Standard waste container () 2. Polythene bag () 3. pile outside ()
4. other () specify

8. How is your solid waste disposed of?

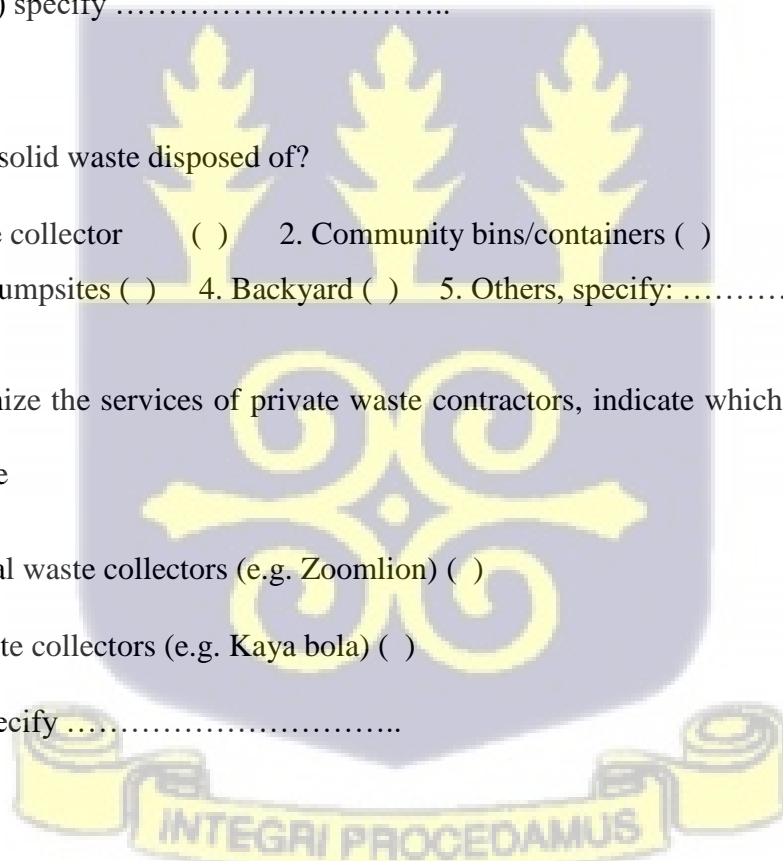
1. Private waste collector () 2. Community bins/containers ()
3. Communal dumpsites () 4. Backyard () 5. Others, specify:

9. If you patronize the services of private waste contractors, indicate which of these collects your solid waste

1. Private formal waste collectors (e.g. Zoomlion) ()
2. Informal waste collectors (e.g. Kaya bola) ()
3. Other (), specify

10. How did you get to know of this private waste collector?

1. Assembly member () 2. They came to introduce themselves ()
3. Through the radio () 4. Through a neighbour ()



11. Please indicate the type of waste collection system adopted by private waste collectors in your house by placing a checkmark (✓) in the right columns.

Waste collection by operators	Tick
House-to-house collection	
Community bins/containers	
Communal dumpsites	
Other specify.....	

12. Do you pay for solid waste disposal?

1. Yes () 2. No ()

13. if Yes, how much do you pay monthly (GH¢) and indicate the type of service used

.....

14. In your own view, is the fee affordable?

1. Yes () 2. No ()

15. Does the service provided benefit what you are paying?

1. Yes () 2. No ()

16. Do you have the means to pay for the fee charged?

Yes () No ()

17. If no, why?

I am not working () My income is very small () Others, specify:

18. Has the price you pay changed over the period of their operations?

1. Yes () 2. No ()

19. How often do they collect waste in your house within a month?

1. Daily () 2. weekly 3. () bi-weekly () 4. Three weeks ()

5. Others (specify)

20. Do you find the rate of collection adequate? Yes () No ().

21. If no, how often would you prefer your household waste be collected in your area?

1. Daily () 2. Once a week () 3. Twice in a week () 4. Every fortnight ()

5. Others (specify)

22. Has there been situations where they have not collected waste within a specified period?

1. Yes () 2. No ()

If no to question 22, please skip to question 26

23. How frequent is this?

1. Very frequent () 2. Frequent () 3. Once a while () 4. Just once ()

24. What accounts/ed for this situation?

.....
.....
.....

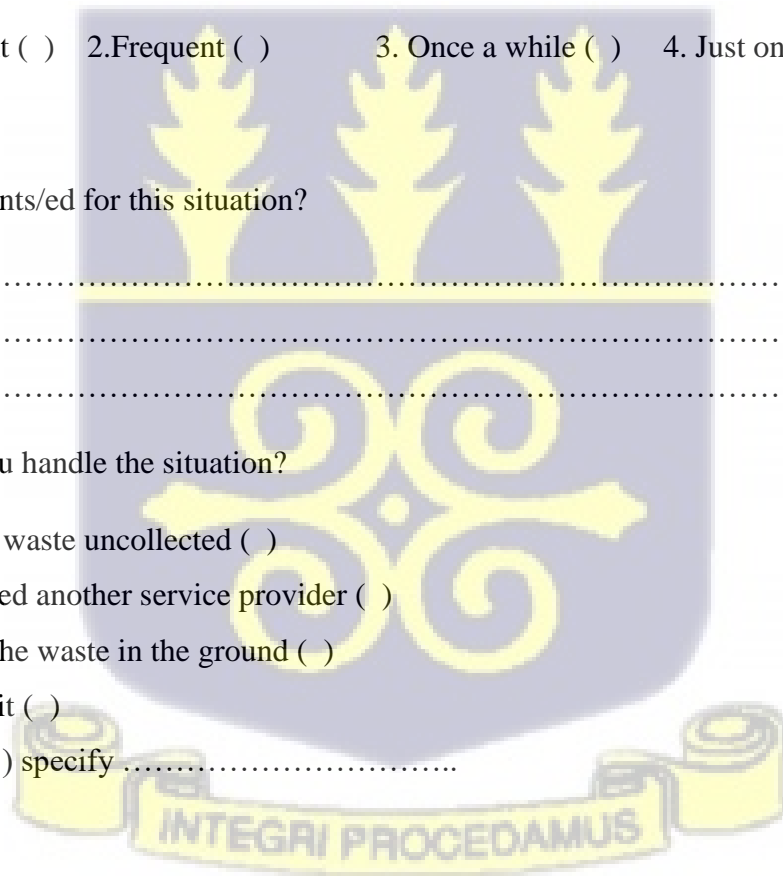
25. How did you handle the situation?

1. Left the waste uncollected ()
2. contracted another service provider ()
3. Buried the waste in the ground ()
4. Burned it ()
5. Other () specify

26. Do you have any idea where service providers dispose of waste collected from your house?

1. Yes () 2. No ()

27. If yes, where do they dispose of the waste



Performance evaluation of service providers and how much residents are willing to pay for enhanced waste services.

28. How will you assess private waste collectors on a 5-point Likert Scale by checking (✓) in the right columns where 1 = very good, 2 = good, 3 = moderate, 4 = bad, 5 = very bad

Criteria	1	2	3	4	
Collection rate					
Logistics and waste collection equipment					
Customer relations					
Amount charged for waste collection					

29. How will you rate the performance of the solid waste service providers in your area?

1. Very poor () 2. Poor () 3. Fair () 4. Good () 5. Very good ()

30. Are you be willing to pay more for improved solid waste services from the service providers?

1. Yes () 2. No ()

31. If no why would you be unwilling to pay?

.....

If no to question 30, please skip to question 34

32. If yes to question 30, please indicate some of the considerations.

Please tick as many as are applicable in your situation?

Considerations	Tick
Improved collection rate	
Improved customer relation	
Equipment and logistics used for collection	
Other, specify.....	

33. What amount would you be willing to pay?

..... (GHC)

Consumers’ perspective of problems affecting solid waste collection services in the households.

34. Please indicate the challenges in relation with waste collection services placing a checkmark (✓) in the right columns.

Challenges	Tick
Unreliable service providers	
High cost	
Inadequate service providers	
Lack of professionalism	
Untidiness of the environment	
Others	

36. Indicate your level of agreement or disagreement with the following challenges stated as being the common challenge facing waste management in your locality. Tick in the right column under the 5-point Likert scale where; 1= Strongly disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly agree

Identified Challenges	1	2	3	4	5
Negative attitude and behaviour of people					
Lack of education and awareness					
Inadequate funds and logistics					
Inadequate landfill disposal sites					
Weak policy enforcement and regulation					
Weak capacity of waste management firms					
High cost of waste management					

37. What problems do you experience with irregular collection of these waste?

1. It generates bad odour () 2. Organic waste putrefies () 3. Breeds mosquito ()
 4. Makes the compound dirty and untidy () 5. Other, specify ()

38. Community

Any other comments

.....

Thank you for your time and cooperation!



Appendix B

INTERVIEW GUIDE FOR ASSEMBLY MEMBERS

This interview seeks to collect relevant primary data for the conduct of an academic exercise on the topic “**URBAN SOLID WASTE MANAGEMENT CRISES: AN ASSESSMENT OF THE ENABLING ENVIRONMENT FOR PRIVATE SECTOR PARTICIPATION**” towards the award of Master’s Degree in Geography and Resource Development from the University of Ghana. The purpose of this study is to assess the roles of all stakeholders in the creation of an enabling environment for private sector involvement in sustainable solid waste management. All data collected will be treated with the maximum confidentiality and would be solely used for academic purposes. Your support and contribution would be very much appreciated. Thank you.

1. Can you share with me some insight on the current solid waste management practices currently being undertaken in your electoral area?
2. How often do they collect waste in your electoral areas?
3. How and where do they dispose of the waste collected?
4. When did private waste collectors start their operations in your electoral area and can you share with us the current arrangement between residents in your area and private waste collectors? (including contract arrangement, payment schedule, specific areas where the collection is made and disposal)?
 - 4.1 Has this been the kind of arrangement that has existed between residents in your area and private waste collectors in the past?
5. Could you kindly give a brief on the capacities of the private waste collectors in carrying out their duties in your area?

Capacity in terms of:

 - 5.1 Institutional arrangement (proper definition of their roles and responsibilities)
 - 5.2 Finance
 - 5.3 Human resource capacity and knowledge
 - 5.4 Logistics
6. Could you briefly explain some of the roles and responsibilities of the Assembly in ensuring the effectiveness of the private waste contractors in your area?

6.1 Laws and regulations

6.2 Finance

6.3 Monitoring

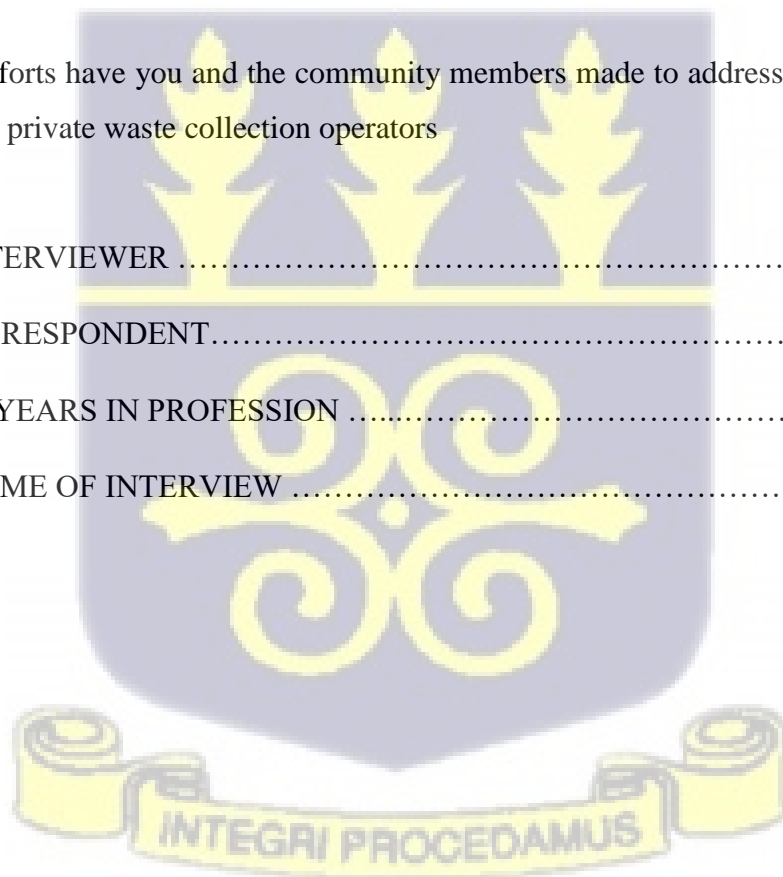
7. How has the Assembly supported private waste collectors to improve the efficiency in delivery?
8. Do you think the private waste operators need additional support and if so what kind of support will this be?
9. What is your assessment of the effectiveness of the operations of private waste collectors in your electoral area?
10. What challenges do members in your electoral area have with the operations of private waste collectors?
11. What efforts have you and the community members made to address these challenges with the private waste collection operators

NAME OF INTERVIEWER

POSITION OF RESPONDENT.....

NUMBER OF YEARS IN PROFESSION

DATE AND TIME OF INTERVIEW



Appendix C

INTERVIEW GUIDE FOR PRIVATE WASTE COMPANIES

This interview seeks to collect relevant primary data for the conduct of an academic exercise on the topic “**URBAN SOLID WASTE MANAGEMENT CRISES: AN ASSESSMENT OF THE ENABLING ENVIRONMENT FOR PRIVATE SECTOR PARTICIPATION**” towards the award of Master’s Degree in Geography and Resource Development from the University of Ghana. The purpose of this study is to assess the roles of all stakeholders in the creation of an enabling environment for private sector involvement in sustainable solid waste management. The data collected will be treated with the maximum confidentiality and would be solely used for academic purposes. Your support and contribution would be very much appreciated. Thank you.

1. Can you share with me some of the solid waste management practices currently ongoing in the Municipality?
2. How often do you go and collect waste from residential areas where you operate within the Municipality?
3. What methods are used by the Assembly in managing the generation of solid waste and why?
(these methods include, Incineration, Composting, ISWM (Reduce, Reuse and Recycle/landfill), None, Other)
4. How and where do you dispose of the waste collected from the various sections?
5. How and when did you start operations with the La Nkwantanang-Madina Municipal Assembly?
6. Can you describe the kind of arrangement you have with the Municipal Assembly (including contract arrangement, payment schedule, specific areas where the collection is made and disposal)?
7. How would you describe your capacity in carrying out waste collection and disposal in the Municipality?

Capacity in terms of:

- a. Institutional arrangement (proper definition of their roles and responsibilities)
- b. Finance
- c. Human resource capacity and knowledge

- d. Logistics
8. What are the roles and responsibilities of the Assembly in ensuring the effectiveness of the operations of the private waste companies?
 - a. Laws and regulations
 - b. Finance
 - c. Monitoring
 9. What support does the Assembly give to improve the efficiency of your operations? (technical and logistical support)
 10. Is the support enough to enhance delivery of your work and why (i.e., if it is enough or not enough)?
 11. Per the support you get, are there additional support that you may require to enhance your work delivery?
 12. Which areas of your operations have you had the most challenges or difficulties?
 13. What resources are needed for managing solid waste in the municipality? Are they available, adequate and who is responsible for providing them?
 14. Do you have the available skilled personnel for your operations (Technical Staff)
 15. What challenges do you encounter collecting solid waste in various houses?
 16. What challenges do you encounter working with the Assembly in managing waste in the Municipality? (including challenges on your part, those coming from the Assembly and the residents)
 17. How can the problems be solved?
 18. What have you done to address or overcome some of the challenges you have mentioned?
 19. What plans do you have to enhance sustainable solid waste management in the Municipality?

NAME OF INTERVIEWER

POSITION OF RESPONDENT.....

NUMBER OF YEARS IN PROFESSION

DATE AND TIME OF INTERVIEW

Appendix D

INTERVIEW GUIDE FOR THE MUNICIPAL ASSEMBLY

This interview seeks to collect relevant primary data for the conduct of an academic exercise on the topic “**URBAN SOLID WASTE MANAGEMENT CRISES: AN ASSESSMENT OF THE ENABLING ENVIRONMENT FOR PRIVATE SECTOR PARTICIPATION**” towards the award of Master’s Degree in Geography and Resource Development from the University of Ghana. The purpose of this study is to assess the roles of all stakeholders in the creation of an enabling environment for private sector involvement in sustainable solid waste management. All data collected will be treated with the maximum confidentiality and would be solely used for academic purposes. Your support and contribution would be very much appreciated. Thank you.

1. Can you share some insight with us on solid waste management practices currently at play in the Municipality?
2. How has the Assembly supported households to enhance waste storage and collection?
3. What kind of arrangement do you have with private waste collectors?
 - 3.1 Has this been the kind of arrangement that has existed between the Assembly and private waste collectors in times past? If no, how was it previously?
4. Since when have you been working with the current private waste collector and how will you assess their performance
5. How would you describe the capacity of private waste companies in carrying out waste collection and disposal in the Municipality?

Capacity in terms of:

 - 5.1 Institutional arrangement (proper definition of their roles and responsibilities)
 - 5.2 Finance
 - 5.3 Human resource capacity and knowledge
 - 5.4 Logistics
6. Which areas of their operations have you had challenges or difficulties with?
7. What are the roles and responsibilities of the Assembly in ensuring the effectiveness of private waste operators?
 - 7.1 Laws and regulations
 - 7.2 Finance

7.3 Monitoring

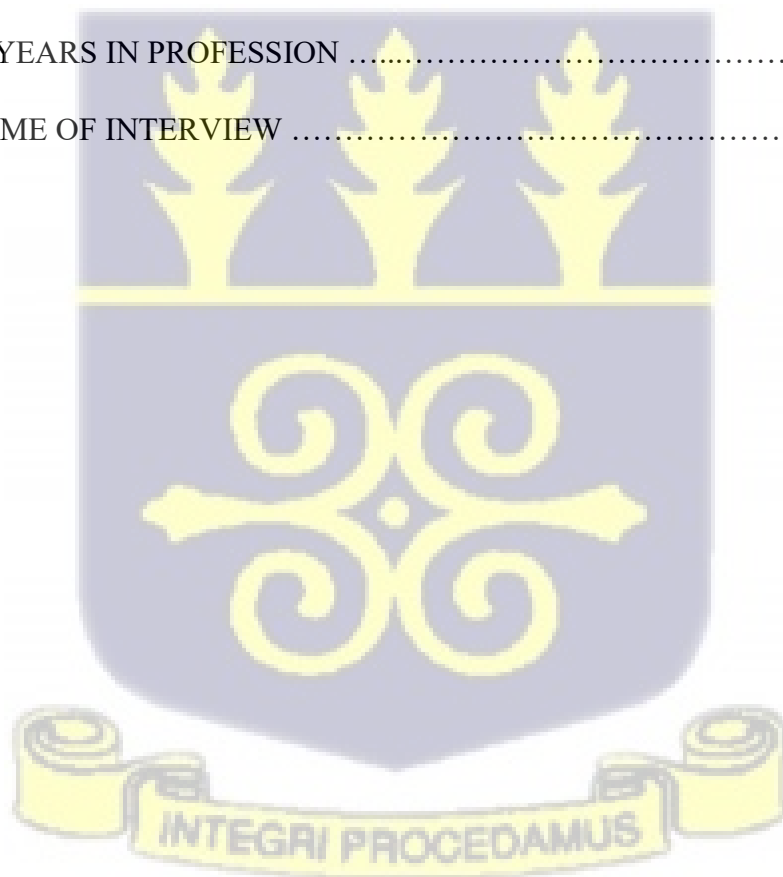
8. What support system do you have in place to improve on the efficiency of private waste collectors (technical and logistical support)
9. Have these support systems yielded the necessary outcome in terms of improving the efficiency of private waste collectors. How?
10. How do you ensure meeting your financial obligation to the private waste collection operator?
11. What plans do you have to create a better enabling environment to enhance the effectiveness of private waste collectors in the Municipality?

NAME OF INTERVIEWER

POSITION OF RESPONDENT.....

NUMBER OF YEARS IN PROFESSION

DATE AND TIME OF INTERVIEW



Appendix E

CALCULATION OF SAMPLE SIZES

$$n = \frac{N}{1 + N(e)^2}$$

n is the sample size

N is the total number of households

And e is the margin of error

The sample frame of 2,041 and the margin of error of 0.07 is substituted in the equation;

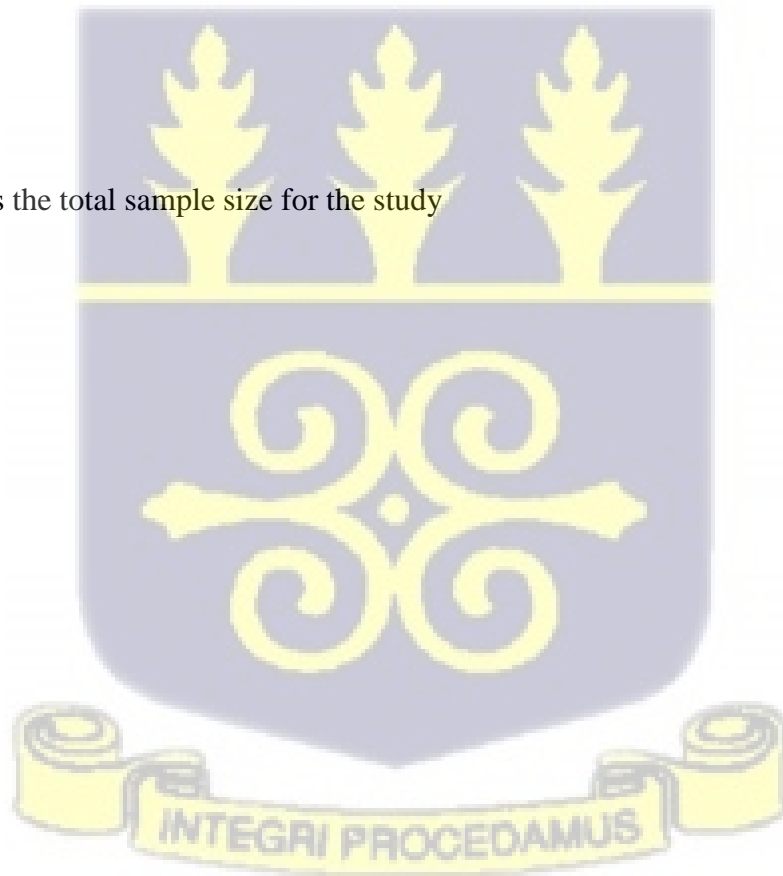
$$N = 2,041 / 1 + 2,041 (0.07)^2$$

$$n = 2,041 / 2,042 (0.0049)$$

$$n = 2,041 / 10.01$$

$$n = 203.90$$

n = 204 which is the total sample size for the study



Appendix F

CALCULATION OF SAMPLE SIZE FOR THE SELECTED COMMUNITIES

Communities	No. of Households	Percentage	Sample size	Calculated sample size
Pantang	189	$189/2041 * 100$ =9.3%	$9.3/100 * 186$ =17.30	17
North Legon	197	$197/2041 * 100$ =9.7%	$9.7/100 * 186$ =18.04	18
Oyarifa	495	$495/2041 * 100$ =24.3%	$24.3/100 * 186$ =45.2	45
Madina Zongo	784	$784/2041 * 100$ =38.4%	$38.4/100 * 186$ =71.4	72
Danfa	244	$244/2041 * 100$ =12%	$12/100 * 186$ =22.32	22
Ayimensah	132	$132/2041 * 100$ =6.5%	$6.5/100 * 186$ =12.09	12
Total	2,041	100		186

Source: Authors construct

