

UNIVERSITY FOR DEVELOPMENT STUDIES

AN ASSESSMENT OF THE EFFECTIVENESS OF PUBLIC PRIVATE
PARTNERSHIP (PPP) BETWEEN WA MUNICIPAL ASSEMBLY AND
ZOOMLION COMPANY IN SOLID WASTE MANAGEMENT IN THE WA
MUNICIPALITY

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POLUKUU TITUS

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MANAGEMENT IN THE WA MUNICIPALITY

BY

POLUKUU TITUS (BA. INTEGRATED DEVELOPMENT STUDIES)

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DECLARATION

Student

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere:

Candidate's Signature: Date:

Name:

Supervisor

I hereby declare that the preparation and presentation of the thesis was supervised in accordance with the guidelines on supervision of thesis laid down by the University for Development Studies.

Name: Dr.Kanton I. Osumanu

Signature: Date:



ABSTRACT

In recent times, the critical issue of waste management has become a major subject of interest to most scholars of climate change and sustainable development experts. Protecting clean water and improving clean air are a major concern in the delivery of public service in the area of waste management in the manner that does not cause further damage to the future generations. Thus the concern of government worldwide on the benefits and challenges faced by the government and the private sector in the management of waste as a means of protecting the vulnerable in society.

The thesis examined the public private partnership between the Zoomlion Company Limited of Ghana and the Wa Municipal Assembly. The study looked at the benefits and challenges of PPP arrangement in waste management and how effective waste management could become with the introduction of the private sector to partner the public sector.

The mixed method approach of research was adopted which includes the quantitative method of research as well as the qualitative method of research. While the quantitative method adopted simple random sampling for data collection from about 240 respondents using questionnaires, the qualitative method adopted in-depth expert interviews of about 17 respondents through purposive sampling officials of both Zoomlion and the Wa Municipal Assembly. The case study approach of the study was adopted to enable the researcher focus on the intricacies and complexities of the problem within the Wa Municipality. Data were collected from both primary and secondary sources. About 257 data respondents were engaged comprising 240 through questionnaires and 17 as face to face interview.



Data were analyzed using the SPSS which show simple descriptive statistic in MS excel as well as contents analysis.

Key findings of the study revealed that the activities of PPP in solid waste management are satisfactory in the municipality. It discovers that the participation of the private sector in the solid waste management of the assembly has contributed immensely to not only clean and beautiful environment but it has contributed to an improved revenue mobilizations well as reducing all forms of activities that hitherto use to lead to malaria and cholera. The study also found that private actors are more involved than the public actors and even on an individual basis in the household, women were found to be more effective in handling waste and sanitation issue than males. The study again found out that, PPP arrangement as far as solid waste management in concern in the Wa Municipals Assembly is the best option because, from the analysis, it has come out clearly that it is most efficient and result due to mutual accountability.

The study, therefore, recommends that a comprehensive education should be carried out to ensure that more persons understand that the more waste they generate the more revenue the waste management companies make and the less money available to the Wa municipal assembly for the delivery of other critical social services. There must be an attitudinal change especially in the early years of development of the child.

This would enable the municipal assembly as part of its constitutional mandate to focus on poverty reduction, sustainable livelihood development and enhancing capacity building and jobs for the development of the local economy of the area.



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My gratitude also goes to all department heads of Zoomlion Wa, the works department of the Wa Municipal Assembly and the respondents who accepted me into their homes during the period of this research Thank you very much.



DEDICATION

This thesis is dedicated to the Polukuu family of Nandom-Ko, for all the encouragement and support throughout my entire life in education.

A special dedication to my Daughter Miss Polukuu Lieb-Aenuo Michella.

And to all my friends who have also been very helpful in many diverse ways. God bless you.



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LIST OF ABBREVIATIONS

APA	American Psychological Association
BBO	Buy- Build –Operate
BLOT	Build-Lease-Operate-Transfer
BOO	Build-Own-Operate
BOOT	Build-Own-Operate-Transfer
BOT	Build-Operate-Transfer
CBOS	Community Based Organisations
CO ₂	Carbon Dioxide
CSO	Civil Society Organisations
DBFO	Design-Build-Finance –Operate
DBOL	Design-Build-Operate License
EPA	Environmental Protection Agency
EPSM	Equal Probability Selection Method
GEO	Global Environmental Outlook
JHS	Junior High School
LFGS	Land Fill Gases
LI	Legislative Instrument
MDG’S	Millennium Development Goals
MMDA’S	Metropolitan Municipal and District Assembly’s
MOFA	Ministry of Food and Agriculture
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
MWD	Municipal Waste Department
NADMO	National Disaster Control and Management Organisation



NGOS	Non-Governmental Organisations
NPM	New Public Management
O&MC	Operation and Maintenance Contract
PPP	Public -Private Partnership
PVCS	Polyvinyl Chlorides
RPCU	Regional Planning and Coordinating Unit
SHS	Senior High School
SPSS	Statistical Package for Social Scientist
SW	Solid Waste
SWM	Solid Waste Management
UN	United Nation
UNECE	United Nation Economic Commission for Europe
UNDP	United Nation Development Programme
UNEP	United Nation Environmental Programme
US\$	United States Dollar
USW	Urban Solid Waste
UWR	Upper West Region
WMA	Wa Municipal Assembly



CHAPTER ONE

GENERAL INTRODUCTION

1.1 Background of the Study

Waste management is a global phenomenon and a product of urbanization. Solid waste management has become a major challenge in many cities in the developing world, where hitherto waste management had been the sole responsibility of central governments. The problems of solid waste in these countries have been worsened with rapid urbanization and growing numbers of slums resulting in major problems relating to public health, environmental pollution and aesthetic nuisance (Katusiimeh *et al.*, 2012). Solid waste management is one of the functions that have been devolved to local government in a number of countries in the developed world and now growing in the developing countries (Van Dijk, 2006). The proper handling of this task is often taken as an indicator of the successfulness of urban reform. But unfortunately, most of the developing world especially those in the Sub-Saharan countries are struggling with the waste management menace as well as slums sprawling.

Public services delivery has been failing in developing countries for a long time. The expectation was that decentralization and private sector participation in developing countries would improve service delivery, which has often not happened. Obviously, decentralization and private sector participation alone is not enough, if proper policies, strategic frameworks for performance measurements and regulations are not strictly followed. The solution to poor service delivery will depend, not only on the private sector involvement but also on the capacity of actors in solid waste, institutional arrangements, and the ability of local governments or independent regulators to monitor performance, regulate and facilitate the solid waste service delivery (Van Dijk, 2006). Due to rapid urbanization, urban solid waste has become a big crisis. More than half of the world's population are living in urban areas or towns.



Cohen (2004) found that at the beginning of the twentieth century, just 16 cities in the world contained a million people or more. A report by the United Nations Environmental Programme (UNEP) indicates that all over the world, nearly 3,000 million people live in urban areas and, every day, approximately 160,000 people join them (Global Environment Outlook, 2000). Urban population growth rate varies among countries and regions. In South Asian countries over the past 50 years, the urban population has grown by about 300 million people. In 1950, only 18 percent (around 72 million people) of the region's population lived in urban areas. But by 2000, 27 percent (around 372 million people) of the region's population resided in urban areas. The latest UN projections suggest that an additional half a billion people will be added to urban areas in South Asia over the next 30 years, presenting a daunting challenge for urban management. As the region's population has become more urbanized, the number and size of the cities have increased (Cohen, 2004) as well as production rate of urban solid waste (USW) or municipal solid waste (MSW).

Typically low-income countries produce around 0.4 to 0.6 kg/person/day, whereas developed countries generate about 0.7 to 1.8 kg/person/day (Zerbock, 2007). Policy analysis and evaluation focus on the process of policy formulation, implementation, and evaluation (Van Dijk, 2006). There are three mechanisms of regulating public services in cities: price regulation, service quality regulation and access to information regulation. Regulation is defined as sustained and focused control, exercised by a public agency over activities valued by a community. One may also wonder whether it is a question of a good regulatory framework or of working in a context in which people have confidence. In countries like China and in Tanzania the operators seem to have confidence in new policies, which makes it much easier to implement.





In Ghana, like most African countries, local government authorities have traditionally been responsible for public services including solid waste management services. However, due to government's inability to provide adequate and efficient waste management services, private sector involvement in urban solid waste management was initiated in the early 1990s to reduce the financial burden on local governments, improve access to solid waste services and ensure efficient and quality service delivery. The move towards private sector involvement in waste management in the country was largely influenced by the World Bank's sponsored Urban Environmental Sanitation Project (World Bank, 1996) and this has grown to receive backing from the National Environmental Sanitation Policy (1999), which was revised in September 2010. Currently, contracting out to the private sector has become the predominant approach for delivering waste management services in many cities in Ghana with the private sector collecting over 80% of the waste generated in many cities in the country.

Just as the benefits of private sector participation in waste management abound in literature (Baud, 2001; Helmsing, 2000 cited in Oteng-Ababio, 2010), there are also inconclusive findings that seem to dispute the outlined benefits of the private sector and its superiority over the public sector (Awortwi, 2004). There is a growing recognition that for the private sector to deliver its assigned duties, appropriate safeguards must be built to ensure that the private sector operates in a competitive and accountable environment (Cointreau-Levine, 1994; Awortwi, 2004; Oteng-Ababio, 2010). Among the key arguments for private sector participation in waste management is to improve the quality of service delivery. Private waste management firms are therefore considered to be reliable and efficient in delivering waste management services.

1.2 Problem Statement

Climate change, population growth, rapid urbanization, and industrialization have challenged the normal way of living of persons across the continents. Largely, the public sector is responsible for the provision of social facilities to manage solid waste especially in cities of developing countries (Ababio, 2010). Increasing population and economic development have produced growing volumes of waste to be managed. The environmental health hazards as well as the various forms of degradation it brings to the soil and its fertility makes it a critical concern. Due to the inability of the public sector to effectively manage the waste disposal, management systems has called for the participation of the private sector in the area in order to allow for reform in the sector (Saei, 2012; Ababio, 2010). The challenges for these countries are to improve their solid waste management systems for both economic and environmental reasons. It has been argued that partnership between public and private sectors lead to improvement in the delivery of solid waste services (Saei, 2012). Due to problems faced by developing countries to manage their solid wastes in their cities, several countries have turned to manage wastes by cooperating with the private sector. Ahmed,& Ali, (2004) have argued that PPPs helps to manage wastes in several ways but if there is no conducive environment, such as support from the public sector and households, the private sector finds difficulties managing waste effectively.

Waste Management includes waste collection, transport, sorting, recycling or disposal, and monitoring of waste materials and includes the actors, people, and organizations engaged in these processes. According to the United Nations Development Programme (UNDP, 1997) in 151 cities around the world, the second most serious problem that city dwellers faced (after unemployment) is insufficient solid waste disposal. Typically one to two-thirds of the solid wastes that are generated is not collected (UNDP 1997).



This is either due to inadequate social facilities and or the non-participation of private companies and private citizens.

Global Waste Management Market Report (2007) estimated that 2.02 billion tons of solid wastes were generated in 2006 with 7 percent annual increase since 2003. The report further noted that from 2007 to 2011 global MSW increased by 37.3 percent with approximately 8 percent annual increase rate.

The failure of municipal solid waste management (MSWM) has resulted in serious health problems and environmental degradation. For instance, due to deficient collection services, uncollected waste is dumped on streets and in drains, thereby contributing to flooding, breeding of insects and rodent vectors, and spreading of diseases. Furthermore, some collected wastes are disposed off in uncontrolled dump sites or burnt openly (Da Zhu *et al.*, 2008). These have been identified to cause environmental, economic, social and cultural problems. The rate of SW production is dependent on the density of urban population, the size of the urban habitation, consumption rate of commercial goods, income and lifestyles, the degree of industrialization, institutionalism and commercialism (Hope, 1998), geographical location, energy resources, climate, living standards and cultural habits.

The quality and effectiveness of service delivery in the waste management are dependent on the participation of the private sector (Saei, 2012; Ababio, 2010). However, Karanja (2005), argued that even the participation of the private sector may yield little or no results, without appropriate policies and regulation in the sector. And these must be complemented by managerial and technical support as well as resources from the central government in a timely and fluid manner (Long *et al.*, 2009; Obirih-Opah and Post, 2002).



While there has been some research work on PPP arrangement in general, these focused on economic development (Benn & Gaus, 1983; Bhuiyan, 2010; Blacke, 2004; Chauhan & Gopalakrishnan, (1983). Solid waste management has been done on the PPP arrangement with regards to waste management (Biehl, 2004; Blackwell & Fawcett; 2009; Chularathna, 2009). Even, where these researches are about the PPPs of effective waste management, there are either done on waste management in general, or in the Western countries (Jones & Pisa, 2000; Rakodi, 2003). Therefore, it is imperative for a research work to be conducted into the effectiveness of PPP arrangement in solid waste management in the WA Municipal assembly which is north of the capital city of Accra. It is also important to examine how the participation of the private sector is aiding solid waste management in a relatively less populous city in Ghana as compared to Accra, Kumasi, Takoradi or even Tamale.

Consequently, this research sought to measure the satisfaction of data respondents, benefits and various challenges that were faced in the engagement of the Zoomlion Company as a private waste company in the WA Municipal Assembly.

1.3 General Objectives

This thesis critically examined the effectiveness of Public Private Partnership agreements between Zoomlion Ghana Limited and the Wa Municipality in waste solid waste management taking a case study look at the Wa Municipal Assembly.

1.3.1 Specifically objectives of the study are,

- i. To assess the types of solid waste, source of waste and delineate waste problem in the Wa municipality
- ii. To examine the benefits of PPP arrangements in waste managements



- iii. To examine major problems or challenges faced by partners in the PPP to propose measures for effective PPPs in solid waste management

1.4 Research Questions

The study is guided by the following specific research questions:

- i. What are types of solid waste, source of waste and delineate waste problem in the Wa municipality
- ii. What are the major benefits of PPP arrangements in waste managements
- iii. How measures would address challenges faced in waste management for effective PPP arrangement

1.5 Significance of the study

First and foremost, the concept of solid waste and its related issues are typical of environmental concerns. Hence, it is imperative, beyond all reasonable doubt, that the concept is worthy of being researched. Although there is preponderance of studies on effective solid waste in Ghana, their actual effects are yet to be felt. The researcher is of the view that if a permanent solution is not sought on time, the situation can degenerate into unmanageable dimensions. As a result, the present study aims to fill this gap in literature. The study will provide the needed information to aid policy makers to counteract the situation. Moreover, solid waste management has become a major development challenge in the WMA in recent times. This deserves not only the attention of the Municipal Assembly and the waste management institutions but also concerns of corporate organizations and individuals to find a lasting solution to the problem. This is because vital human resource could be lost through poor waste management and this will affect productivity in the municipality.



To deal with the growing waste management challenges in the perspective of ever increasing urbanization and consumption trends, the private sector has a dominant role to play. In line with Ghana government policy, more than 80 percent of waste management services delivery in Ghana is handled by the private sector (Siaw, 2011). The study, therefore, intends to explore appropriate strategies and recommendations aimed at improving the partnership of the two institutions in clearing solid waste in all segments of the municipality in a sustainable manner. The study will also serve as a reference point to MMDAs and waste management institutions, especially Zoomlion Ghana Ltd., as far as solid waste management is concerned. In this case, it will give them an in-depth understanding of the realities and the strategies to tackle the problems. Additionally, the study will contribute to the existing body of knowledge on municipal solid waste management and also stimulate further research on the subject in other municipalities.

1.6 Organization of the Study

The study will be organized in five chapters. Chapter one is basically an introductory chapter to the research. Sub topics discussed under this chapter include the background of the study including previous studies on the topic, the problem statement, research questions, the objectives of the study, justification of the study, scope and of the research, and the organization of the study.

Chapter Two includes reviews of relevant literature to the study. The chapter also discusses the works relevant to the study. It covers the concept of solid waste, classification of waste, causes of waste, solid waste management, the public-private partnership, new public management and governance, theoretical framework of the study as well as theories on effective solid waste management.



Chapter Three deals with the methodological issues regarding the study. Sub headings here include the study area, sources of data, target population, sampling methods and techniques, research instrumentation, data analysis plan as well as issues from the field and ethics and how they were addressed.

Chapter four centered on data presentation, discussion, and analysis. The chapter contains tables, figures, graphs, among others, to elaborate more on the issues being discussed. Specific issues include socio-demographic characteristics, discussions, and analysis of the survey questionnaires in line with the study objectives.

Chapter Five has to do with drawing conclusions on the basis of the findings and an indication of their relevance or policy making implications. Recommendations have also been made in this chapter.

1.7 Scope of the Study

The scope of this study is determined by the geographical coverage, study content and the research design. The concept of PPP in solid waste management is very broad; hence, the geographical scope of the study covered only the Wa Municipality in the Upper West Region of Ghana. Contextually, the study focuses on investigating public private partnership in SWM in growing towns of Ghana as an effective option for solid waste management. In this regard, the study will focus on the effectiveness of private sector participation in solid waste management. Again, waste management is a broad area as there are various types of waste. However, the focus of this study is on solid waste management limited to the operations of the Zoomlion Ghana Limited only in the Wa Municipal Assembly of the Upper West Region of the Republic of Ghana.

MSW is defined as a waste which is generated by households, commercial enterprises such as offices, hotels, supermarkets, shops, schools, institutions and municipal services such as street cleaning. This MSW does not include the waste from mining,



construction or destruction activities and industrial manufacturers (Ngoc and Schnitzer, 2009).

1.8 Context of Public Private Partnership Arrangement in Waste Management in Ghana

Public–Private Partnerships, also known as P3 or PPPs, are contracts services between government agencies and private businesses, the private Companies deliver vital services on behalf of the Government agency whiles the central government through the public agency then pay service charges, (reimburse or transfer a public asset to the private sector) in return for goods or services over a set time period. Public –Private Partnerships do not occur in a vacuum but rather in the context of agreements. An agreement will naturally be in the form of a contract that spells out the expected conduct and/or obligations of each partner (Kroukamp 2004; Grimsey & Lewis 2004). To a large extent, the agreement should define the nature of the partnership and the commitments of each role player. In addition, as part of the agreement, the ground rules should be spelled out to ensure optimal cooperation.

By the creation of the District Assemblies, one of the major tasks given to them was to manage the waste generated within their area of jurisdiction. In exercising the power conferred upon them by Section 79 of the Local Government Act of 1993, the Metropolitan Assemblies are to create Waste Management Departments (WMDs) and to enact by-laws to enable the WMD to perform their waste management functions. In addition, the Environmental Sanitation Policy (1999) published by the Ministry of Local Government and Rural Development (MLGRD) states that:

The District Assemblies [including Metropolitan and Municipal Assemblies] are to be responsible for managing and protecting the environment so as to prevent hazards to human health, conserve natural resources and maintain pleasant surroundings



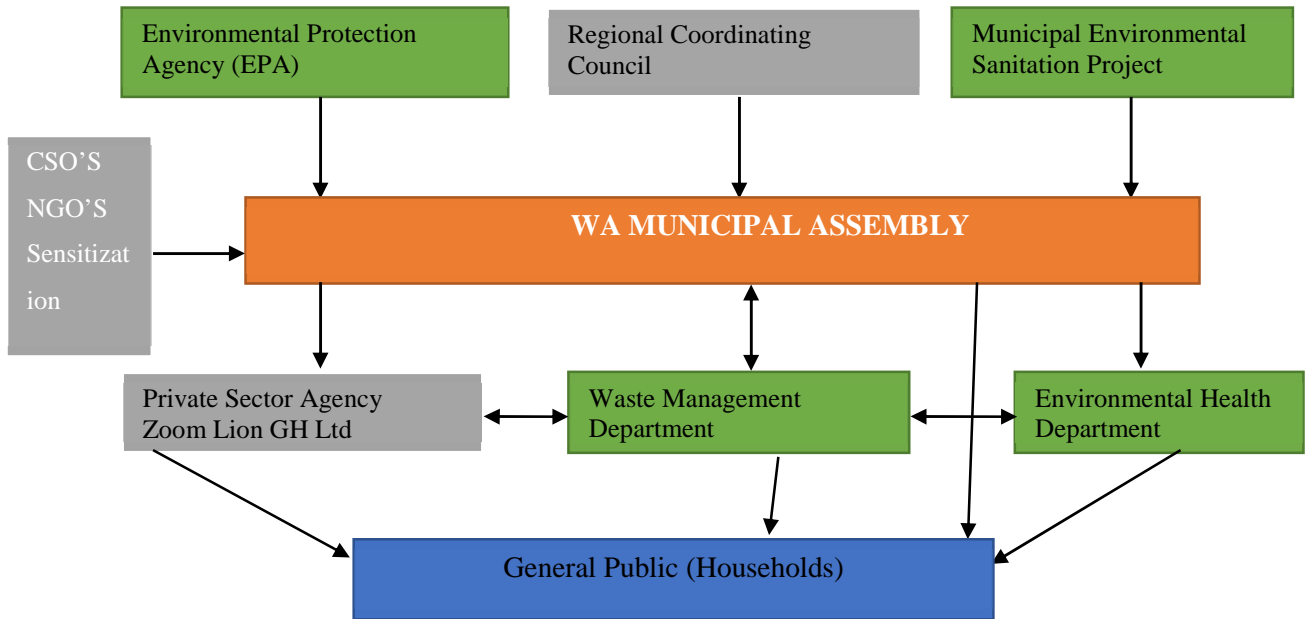
In accordance with the policy framework, immediate responsibility for solid-waste management (collection, transportation, disposal and/or treatment) in the Wa Municipal Area lies with the Municipal Assembly (WMA).

In order to realize these policies and aspirations, there are other institutions and agencies with which works cooperatively with WMA. This is in view of the fact that effective solid waste management depends upon an appropriate distribution of functions, responsibilities, authority, and revenues for national, provincial and local governments, as well as intra-urban entities such as communities (Schubeler, 1996).

All occupiers or owners of premises with the exception of household premises shall designate a member of their staff to be directly responsible for all matters relating to waste management and such designated staff shall liaise with the Assembly or its authorized agents or contractors on all waste approved by the Assembly. WMA is, therefore, the pivot around which all the coordination and partnerships needed for effective waste management revolves, it serves as the policy making body as well as the financier of the waste management services in the metropolis. Thus, all decisions concerning waste management, whether taken directly by WMA itself or other agencies, must be approved by Wa municipal assembly. The Assembly also fixes all user fees to be charged and collected by the private contractors. The private company is accountable to the Assembly because it is the Assembly's responsibility to monitor and evaluate their (private contractors) operations to determine whether their contracts agreement is duly followed or otherwise as shown in figure 1.1 below.



Figure: 1.1 Existing Relationship between Wa Municipal Assembly and Stakeholders



Source: Adapted, Mariwah S, (2012)

1.8.1 Municipal Waste Management Department

The Waste Management Department (WMD) of WMA is one of the departments established by the Metropolitan Assembly to manage environmental sanitation services.

Until the emergence of waste companies, waste collection, transportation and final disposal were the sole responsibility of the Environmental Health Department. The establishment of Waste Management Department of the Assembly under the Local Government Act of 1993 Act 462 (Section 16) requires an integrated waste management approach with regards to the efficient collection and reuse or disposal.

The WMD takes both its mandate and resources from the Assembly; therefore, there is a strong linkage between the Department and the Assembly. At present, the Waste Management Department handles about 20% of the waste collection services in the municipality. It is responsible for monitoring the performance of the private waste collection firm in the municipal.

It is therefore expected that a strong form of partnership and coordination be encouraged between the WMD and the private sector. From an interview with an official of the WMD, it was revealed that some positive outcomes in the form of an increase in the amount of waste collected have been realized since Zoomlion took over the management of solid waste in the municipal.

1.8. 2 Institutional Responsibilities for Waste Management Service Delivery

The PPP between the Wa Municipal Assembly and the Zoomlion is a Service Contracts, and service contracts do not occur in a vacuum but rather in the context of agreements. An agreement will naturally be in the form of a contract that spells out the expected conduct and/or obligations of each partner (Kroukamp 2004; Grimsey & Lewis 2004). To a large extent, the agreement should define the nature of the partnership and the commitments of each role player.

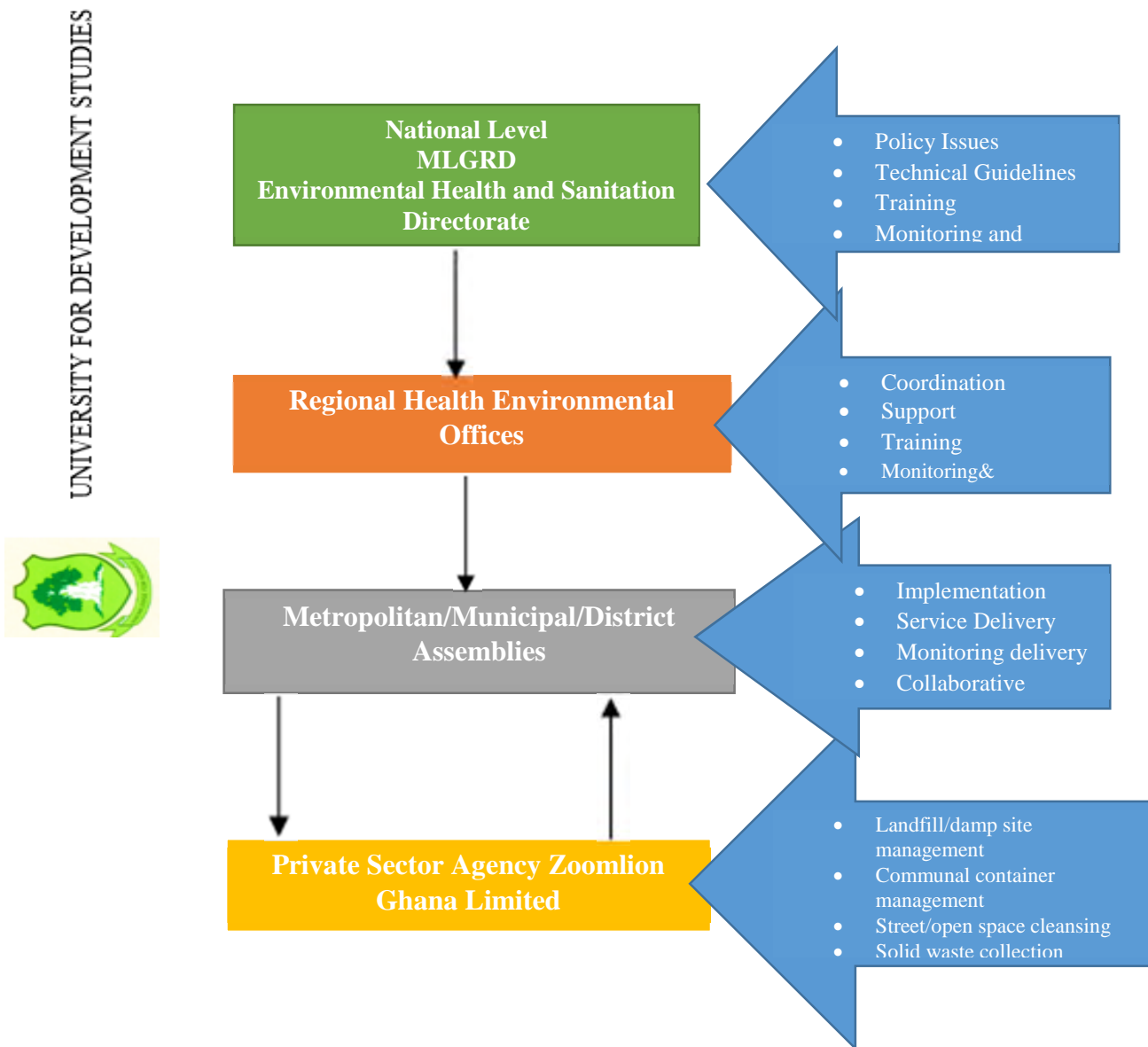
Waste management practices in Ghana are guided by the Environmental Sanitation Policy of 1999 which was revised in the year 2010. This document spells out the roles of the various stakeholders including the private sector as well as the Growth and Poverty Reduction Strategy (GPRS II) which prescribes public-private partnership in solid waste management and other legislative documents. To ensure efficient and effective service delivery, solid waste service providers have been engaged in all the cities to collect and transport waste to final disposal sites. Principally, there are two solid waste collection systems in Ghana - door to door collection system which takes place in the low-density areas of the urban centers, and communal collection system in the high-density areas. There is some amount of pre-collection in areas of poor accessibility based on the use of Manual and Motorized Tricycles introduced by Zoomlion. Waste disposal in Ghana is mainly by land filling (Agyepong, 2011).



The Ministry of Local Government and Rural Development (MLGR&D) is responsible for policy. District Assemblies are the key institutions responsible for waste management service provision at the local and community level. The Ministries also take care of the national level, providing policy and technical guidelines in order to ensure sustainable financing which serves as a catalyst to improving service delivery.

Figure 1.2: Institutional roles and responsibilities for waste management delivery

NATIONAL/REGIONAL/DISTRICT



Source: Authors Construct

1.8.3 The Role and Capacity of Zoomlion as the main Private Sector Agency in Waste Management in Wa Municipality

The traditional mode of procuring public infrastructure and services delivery including waste management proved untenable as the public sector entities mandated with execution were characterized by inefficiencies, poor pricing policies, overstaffing, mismanagement, and stagnation and therefore did not provide value for money to the public clients. Currently, the private sector is taking on a major role in the delivery of what was once considered public sector services. The progressive increase in the role of private service providers in the waste management sector over the past few years has brought about improved effectiveness, efficiency, integration, and accountability.

To deal with the growing waste management challenges in the perspective of ever increasing urbanization and consumption trends, the private sector has a dominant role to play. In line with Ghana government policy, more than 80 percent of waste management services delivery in Ghana is handled by the private sector. (Agyepong 2011)

PPP is, therefore, an institutionalized form of co-operation between the public and private sector organizations. This co-operation involves a joint definition of specific targets and a clear allocation of responsibilities as well as the determination of areas of competence between the public and private sector organisations in pursuit of common goals. The co-operation is an enduring and stable relationship between the partners, in this case, the municipal and the waste giants –Zoomlion Ghana Ltd. So the partnerships conceived in this context fits well for the management of waste in the municipality.

The partners share the risks and rewards of the partnership in proportion to their level of investment in the project being undertaken by the partnership (Grimsey 2002; Jones 2002; Blake2004).



The concept of private sector participation in the delivery of municipal services was introduced to Upper West and Wa Municipal in the year 2006.

The government of Ghana, through the MLGRD, signed a waste management contract as part of the Public Private partnership (PPP) with Zoomlion Ghana Limited (a private waste management company) to collect and dispose waste in all the districts in the country. The company currently handles about 80% of the waste generated in the municipality; with a core staff strength of 4 (municipal manager, operations monitor, tricycle supervisor and an administrative Assistant) are complemented by drivers and janitors and a project staff strength of 510 workers are responsible for the communal container lifting and street/ public places (markets, lorry stations, principal streets and the official residence of government) sweeping and other as spelled out in the contract content. In the case of the Wa Municipal Assembly, the contract is to supply 30 communal containers and 3 refuse trucks, 5 loaders for use within the operational area which include, Busai, Boli, Piissi, Nakori, Chireeh, Bamahu, Kperisi, and central business district of the municipality during collection and onwards transportation to the dump site.

The assembly pays the Zoomlion on a quarterly basis an amount of GHC 45,000.00 for the service (Municipal Finance Officer, 2015). Under the contract, Zoomlion is responsible for the repairs and maintenance of the trucks, payment of the drivers and Janitors as well as replacement of the vehicles when they get old.

Other services delivery such as the door to door distribution of Waste Bins and collection-transportation of waste is delivered on franchised basis.

Though the private waste management company has strong links with WMA, however, there has been a pocket of complaints of late about the quality of services rendered by Zoomlion janitors in some public places.



Sometimes most of the areas are left unattended to for days. On the other hand, the companies have also constantly registered their displeasure about the non-timely payment by the Assembly which they blame for their poor performance. However, the role of Zoomlion in a PPP agreement can also be viewed as a form of a trust relationship in which each partner is, to a large extent, a principal in its own right and therefore does not have to refer to other sources of authority (Akintoye, Beck & Hardcastle 2003:6).

1.9 Conclusion

Waste management is a very critical requirement for the development of clean environment and improved land. Its relevance, especially in the developing countries, cannot be overemphasized. The Public Private Partnership agreement is one sure way of achieving the efficiency in the management of waste as well as ensuring that the responsibilities of the citizens or government are not shifted to other stakeholders. It is, therefore, necessary to consult a research into the effectiveness of PPP arrangement in waste management in order to confirm or contradict the assertion in the literature that PPPs necessarily leads to effective waste management.



CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL ISSUES

2.1 Introduction

This chapter provides a comprehensive review of relevant literature on the effectiveness of PPPs in waste management. The literature review looked at the development of waste management, types and sources of waste, in the world as well as Ghana. The review provided literature on thematic areas such as the benefits of PPPs in waste management challenges facing solid waste managements and how the uses of PPPs help make PPPs waste management arrangements effective. The study shall consequently, compare, analyse, critic and draw conclusions from emerging trends in the socially responsible practices.

2.2 Overview of PPPs in Solid Waste Management.

The European Council defines waste management as the collection, transport, recovery, and disposal of waste, including the supervision of such operations and after-care of disposal sites (Pongrácz, 2002). For the purpose of this research, (effective) waste management is operationally defined as the collection, transport, and recovery-disposal of waste. These are three related activities with the effective management of waste. They can be construed as interlocking links in a chain. In the past, waste generated by human activities was disposed of in a wide variety of ways. It was heaped and burnt, strewn around or buried (in rivers, gully or in the veldt). There was no agreed uniform system of waste collection because little or no attention and importance was attached to the proper management of waste. The collection of waste is regarded as the crucial first step in the chain of waste management. It is a labor intensive phase and therefore also the most expensive one in the waste management process (Raj, 2000).



The transport of waste differs according to cities and countries. Collection vehicles range from trailers to specialized trucks equipped with waste compacting mechanisms. These trucks are expensive and not available to many cash-strapped authorities. The latest mechanized infrastructure to collect and treat solid waste is extremely expensive, and often beyond the reach of developing governments and cities with a very narrow economic base (Raj, 2000). As a result, these poor cities turn into heaps of garbage. Currently, because of global population growth in the world, cities increasingly have to deal with an acute shortage of usable land to dispose waste. This inevitably creates the problem of where to dispose the growing volume of waste in a shrinking environment.

2.2.1 Solid Waste Management

The common methods of municipal solid waste management are land filling, incineration, composting and anaerobic digestion. Incineration, composting and anaerobic digestion are volume reducing technologies; ultimately, residues from these methods must be land filled (Seo, 2004). Land filling is the only true “disposal” method of managing MSW. It is also the most economical, especially in developing countries where it typically involves pitching refuse into a depression or closed mining site (Daskalopoulos and Auschutz, 1998). Landfills produce landfill gases and Leachate which can harm human and natural systems. Landfill gases (LFG), produced when methanogens decompose complex molecules, are primarily methane and carbon dioxide (up to 90%), but also include CO, nitrogen, alcohols, hydrocarbons, organosulphur compounds, and heavy metals (El-Fadel, 1997). Leachate forms as water percolate intermittently through the refuse pile and can contain high levels of nutrients (nitrogen, phosphorous, potassium), heavy metals, toxins such as cyanide, and dissolved organics (El-Fadel, 1997).



Incineration is the high-temperature combustion of wastes. Non-combustibles must be sorted out before incineration. Benefits of incineration include reduction of the volume of waste and energy production in the form of electricity and heat (Seo, 2004). However, construction and start-up costs of incineration facilities can be prohibitively expensive for developing nations. Compost and anaerobic digestion use natural microbial organisms to decompose the organic fraction of MSW (Seo, 2004). The non-organic fraction must be land filled or incinerated. These methods reduce the volume of waste that must be land filled, and end products can potentially be used as agricultural fertilizers, or processed into fuels for motor vehicles (Sonesson, 2004). However, like incineration, project implementation can be too expensive for poor communities. The next session of the chapter takes care of as overview of the Global waste practices.

2.3 Waste Management in Ghana and its Disposals.

Waste management in Ghana is limited to collection and disposal in landfills by local authorities and in few instances, incinerating, recycling and composting. The 2000 Population and Housing Census showed 57.6% of households dispose solid waste at public dumps. It further pointed out an additional 25.0 % of households dump waste elsewhere which is unsatisfactory. Agyena (1999) found out that approximately 40% of waste generated in Kumasi, the second largest city is collected every day, lagging behind Accra's 60% collection rate (Perlman, 2007). Across the nation, public dumping is the leading disposal method, with a sizable percentage of households burning their domestic waste. The disturbing fact is that about 12% of households in the regional capitals dump their waste in undisclosed ways, which contributes to the littering of streets and blocking of drains. This calls for an insight into what actually leads to improper solid domestic waste management in Ghana, hence, the factors contributing to the improper domestic solid waste management.





Solid waste management has become a major challenge in many cities in the developing world where hitherto waste management had been the sole responsibility of central government. The problems of solid waste in these countries have been worsened with rapid urbanization and growing numbers of slums resulting in major problems relating to public health, environmental pollution and aesthetic nuisance (Katusiimeh *et al.*, 2012). Historically, in many developing countries in Africa, the public sector took monopoly of providing solid waste management services in urban cities and this was largely blamed for the mess in solid waste management. The public sector was commonly reported to be constrained due to lack of managerial and technical capacity, cumbersome procurement procedures and inadequate financial resources (Long *et al.*, 2009; Obirih-Opareh and Post, 2002). These constraints have resulted in an increased interest in Public–private partnerships in urban solid waste management in many developing countries in recent years with the main objective of improving efficiency in waste collection, reducing costs and reforming the weak performance of the public sector (Jones and Pisa, 2000; Rakodi, 2003).

In Ghana like most African countries, local government authorities have traditionally been responsible for public services including solid waste management services. However, due to government inability to provide adequate and efficient waste management services, private sector involvement in urban solid waste management was initiated in the early 1990s to reduce the financial burden on local governments, improve access to solid waste services and ensure efficient and quality service delivery. The move towards private sector involvement in waste management in the country was largely influenced by the World Bank sponsored Urban Environmental Sanitation Project (World Bank, 1996) and this has grown to receive backing from the National Environmental Sanitation Policy (1999) which was revised in September 2010.

Currently, contracting out to the private sector has become the predominant approach for delivering waste management services in many cities in Ghana with the private sector collecting over 80% of the waste generated in many cities in Ghana. (Baud, 2001; Helmsing, 2000 cited in Oteng-Ababio, 2010; Awortwi, 2004; Cointreau-Levine, 1994; Awortwi, 2004)

Obirih-Opareh and Post (2002) assessed the quality of public and private modes of solid waste collection in Accra, Ghana and revealed that private participation in solid waste collection has benefited consumers in terms of wider coverage and service reliability but has also increased environmental dangers and worsened labour conditions. In view of this, customer satisfaction surveys have become the leading criteria for determining the quality of services delivered to customers and a key performance indicator for both public and private organizations (Vavra, 1997; Boyne, 2002).

2.3.1 Factors Contributing to Inappropriate Solid Waste Management

A combination of poverty, population pressure, and economic hardships are placing a considerable strain on household environments in Accra. In Accra, the municipal authorities have not been able to keep pace with the rapid accumulation of waste. This has resulted in waste being found in gutters, drains, and in rivers. Some of the municipality's final garbage disposal sites are also located near the sea and are polluting the Korle Lagoon. These practices have also created an unhealthy environment in Accra (Tsiboe and Marbell, 2004). As one report by the Environmental Protection Agency states, "municipal solid waste has been disposed of anywhere anyhow without regard to the nuisance and harm caused to the environment. All kinds of wastes, regardless of their nature, are being dumped indiscriminately into depressions, sand pits, old quarries, beaches, drains and even in certain areas, along streets (EPA, 2004).



The majority of people in Ghana live below the internationally recognized poverty line of one dollar a day. In view of this, one can imagine the pressure that is put on the city's infrastructure in the course of the day to day activities. Some say the problem of waste disposal in Accra is cultural, others say it is economic, yet others point in the direction of poor management (Tsiboe and Marbell, 2004). Kendie (1999) argues that the recent upsurge in waste disposal problems stems from the fact that attitudes and perceptions towards wastes and the rating of waste disposal issues in peoples' minds and in the scheme of official development plans have not been adequately considered.

Kendie (1999) and Satterthwaite (1998) virtually agree in principle that the waste problem emanates from poverty and lack of funding as a result of low level of economic growth. Agbola (1993) traces the root cause of the problem to imbibed behavioral patterns and acquired values, which are given expression in the people's culture. Post and Obirih-Opare (2003) have pointed to performance and weakness in the waste management institutions as the bane of the waste problem. Following the factors contributing to the improper domestic solid waste management is its consequences. The next section of the literature explains the consequences of improper solid waste management.

2.4 Implications of Improper Solid Waste Management

Improper solid waste management activities can bring about the following:

Increase disease transmission or otherwise threaten public health. Rotting organic materials pose great public health risks, including, as mentioned above, serving as breeding grounds for disease vectors. Waste handlers and waste pickers are especially vulnerable and may also become vectors, contracting and transmitting diseases when human or animal excreta or medical wastes are in the waste stream.





Furthermore, contaminate ground and surface water. Municipal Solid Waste (MSW) streams can bleed toxic materials and pathogenic organisms into an open refuse dump, and other ailments are also high. In downtown Segou, Mali, during the rainy season part of the dump is submerged in water, mixing with leachate, and threatening the health and water supply of the surrounding area. If the landfill is unlined, this runoff can contaminate ground or surface water, depending on the drainage system and the composition of the underlying soils. Many toxic materials, once placed in the general solid waste stream, can be treated or removed only with expensive advanced technologies. Currently, these are generally not feasible in Africa. Even after organic and biological elements are treated, the final product remains harmful.

Moreso, create greenhouse gas emissions and other air pollutants. When organic wastes are disposed of in deep dumps or landfills, they undergo anaerobic degradation and become significant sources of methane, a gas with 21 times the effect of carbon dioxide in trapping heat in the atmosphere. Garbage is often burned in residential areas and in landfills to reduce volume and uncover metals. Burning creates a thick smoke that contains carbon monoxide, soot and nitrogen oxides, all of which are hazardous to human health and degrade urban air quality. Combustion of polyvinyl chlorides (PVCs) generates highly carcinogenic dioxins (Evan, 1994).

Consequently, Damage ecosystems. When solid waste is dumped into rivers or streams it can alter aquatic habitats and harm native flora and fauna. The high nutrient content in organic wastes can deplete dissolved oxygen in water bodies, denying oxygen to fish and other aquatic life forms. Solids can cause sedimentation and change stream flow and bottom habitat. Sitting dumps or landfills in sensitive ecosystems may destroy or significantly damage these valuable natural resources and the services they provide.

Finally, Injure people and property. In locations where shantytowns or slums exist near open dumps or near badly designed or operated landfills, landslides or fires can destroy homes and injure or kill residents. The accumulation of waste along streets may present physical hazards, clog drains and cause localized flooding.

Discourage tourism and other business. The unpleasant odour and unattractive appearance of piles of uncollected solid waste along streets and in fields, forests, and other natural areas can discourage tourism and the establishment and/or maintenance of businesses (Zeiss, 1998).

However, finance alone is not a solution to the problem; the awareness and education are also crucial elements for waste management. Populations have to be made aware of the impact of waste mismanagement. Illiteracy is high in developing countries and waste management education occurs mostly in informal ways. Life styles and value systems, aspirations and behaviors, and level of education can play an important role in the management of solid waste. Lack of general public awareness of waste management is a result of high levels of commingled waste and littering. Since people are not aware of disposal mechanisms, they simply throw all the waste together in un-segregated form.

Fruits like oranges, mangoes, peas are eaten and the seeds and fruits remain littered in the streets. Banana peels, corn husks, and nut shells are scattered all over cities as residents simply throw them away anywhere anytime (Onu, 2000). Through the knowledge of waste management, the population will be able to practice recycling.

Because waste is culturally defined and considered by households as filth and to be of little value, the work of waste collector is also generally viewed as a low-status job in Africa (Mwanthi and Nyabola, 1997).



Therefore the sustained success of a waste management system cannot be achieved without the willingness of the local authority to involve beneficiaries in the initial design of the system as well as the willingness of the public to use it. In developed countries, there is greater responsibility and participation of household in waste management, whereas in developing countries this is not the case (Palmer Development Group, 1996). The method involved in collecting the waste and storing them is very imperative therefore followed to this section is the method of waste collection and storage.

2.5 Theoretical and Conceptual Frameworks

When defining the framework, it's important to look at introducing Public- Private Partnership (PPP) as an implementation policy. PPP is introduced as an organizational scheme to improve SWM. According to Pressman and Wildavsky, (1984), a classical way to model implementation is to conceptualize it as a chain from problem identification action to results.

Implementation is always influenced by involved actors and structures which make the context of the implementation. The implementing framework integrated theory NPM into a single framework. Using this framework, first, the researcher looked at the problems related to SW faced by developing nations. Then the researcher found PPP as a solution to the problem. If PPP is to work properly they need some support from the actors involved in such issues and support from the political side with laws among others.

2.5.1 New Public Management (NPM) and Governance

New public management (NPM) can define "as a body of managerial thought or as an ideological thought system based on ideas generated in the private sector and imported into the public sector" (Larbi, 1999, p.12).



In general, public services are carried out by private sectors with structural, organizational and managerial changes. Palmer (2009) argues that NPM focuses on the management of public services carried out by the private sector with management changes. In this point of view, it is easy to link this to governance and PPP. The term PPP is simply defined as a tool of governance or management (Hodge and Greve, 2005).

UNCE (2008) argues that without good governance it is difficult to guarantee the 'effectiveness' and 'quality' of public services. In economical viewpoint, good governance in PPP should be effective (able to buy and deliver services in high quality with lower prices).

NPM basically discussed fundamental changes to the power relationships between the main players in the system of government and requires significant attitudinal changes on the part of bureaucrats (Samaratunge and Bennington, 2002). NPM tries to ensure better governance with less cost (UNECE, 2008).

The local community is a very important participant in the decision-making process because the people decide how the service should be delivered.

2.6 Critical Actors in SWM

This section clarifies actor oriented theory which is used in the research. Generally, actors play very important role in such problems like SWM. Actor oriented theory gives insight about involved actors and their behaviors.

2.6.1 Private Actors: Commercial (formal private sectors)

The formal private sector includes registered enterprises carrying out SWM services e.g. collection, transport, disposal, and recycling.



The 'formal private sector' can be defined as "private sector corporations, institutions, firms and individuals, operating registered and/or incorporated businesses with official business licenses, an organized labour force governed by labour laws, some degree of capital investment, and generally modern technology" (Klundert and Lardinois, 1995, p.3). These enterprises may be large or small.

2.6.2 Private Actors: Citizens and Informal Sector

This category includes unregistered, unregulated activities undertaken by individuals, families, groups or small scale business waste pickers, itinerant buyers, traders in waste materials and non-registered small-scale enterprises. Informal waste collectors are not regulated or controlled by government agencies (Ahmed and Ali, 2004). In the context of municipal solid waste management (MSWM), the informal recycling sector refers to those involved in picking up the recyclable and reusable materials from mixed waste or from communal bins. Generally, these people are called scavengers and waste pickers. These activities characterize the informal sector as this is labour-intensive, low technology, and low-paid, unrecorded and unregulated work, normally carried out by individuals or family groups (Wilson *et al.*, 2006). Due to poverty, unemployment or under employment, many informal sectors are active in waste management process in developing countries (Klundert and Lardinois, unpublished). Generally, informal waste workers face economic problems, health hazards, difficulties to access social services and social security (Schübeler, 1996).

2.6.3 NGO's and Donor Agencies

National or international Non-governmental organizations (NGOs) are also considered as private actors. Geographical Dictionary (2005) defines an NGO as any charity or volunteer association which takes on responsibility for a particular cause often starting on a small-scale and in response to a particular need such as natural disaster.



Some agencies which consider the environment of peoples' health try to help the developing nations to keep the environment clean. SIL International (1999) defines donor agency as an organization that gives funds for projects of a development nature. The next section of the review is the structural conditions in place of solid waste management which involves the institutional structures and resources being financial, infrastructural, and labor or roles and responsibilities.

2.6.4 Structural Conditions: Institutional Structures

A geographical dictionary defines institution as any established law or custom. Clear and well-defined institutional framework is important for SWM due to the complexity of the WM system and the involvement of many actors (Da Zhu *et al.*, 2008). As a result, authorities have to make possible institutional structures to handle SWM. "Institutional arrangements can be formal or informal (i.e. supported by the rule of law), and these arrangements are set into established social practices" (Obirih-Opareh and Post, 2002:100). To establish these social practices most developing countries set up some legislation or laws or policies and rules and regulations to handle the environmental problem including SWM.

Obirih-Opareh and Post (2002:100) recognized that "the institutional arrangement that has materialized in a particular area depends on numerous factors, including wealth, physical characteristics, the strength of community organization, and prevailing policy of the local authorities". Institutions which focus on WM consider health and environmental issues as well. These arrangements can be adjusted according to the problems faced on the ground. Furthermore, "an institutional arrangement might be viewed as financially workable if it can sustain itself" (Obirih-Opareh and Post, 2002:100).



2.7 Resources

Resources related to SWM include finance, workers, equipment, vehicles, and technology. These resources are identified under various sub headings such as financial, infrastructural and labour (human).

2.7.1 Financial Resources

In general developing nations allocate money for most of the environmental problems such as water pollution and waste management. These nations allocate a small amount of their budget for MSWM. Also, municipalities get taxes from the general public for their services. On the other hand, the private sector has enough money or investment to carry out the services thereby satisfying public needs.

2.7.2 Infrastructures

In developing countries, municipalities or public sectors use different kind of vehicles to collect waste. Normally the municipalities or public enterprises use open trucks, tractor trailers, tipper trucks, dumper trucks, compactor trucks and animal drawn carts (generally in small towns and rural areas) to collect solid waste in the towns or city areas to transport waste to disposal sites. In Sri Lanka, handcarts, two-wheeled tractors, and four-wheeled tractors are commonly used for collections. However, some Local Assemblies have compactor trucks. Types of collection vehicles depend on road width and traffic condition (Vidanaarachchi *et al.*, 2006).

Generally, in developing countries, there is no standardized containers design for waste pick up (Zerbock, 2003). Road plastic barrels or discarded oil drums may be used as waste containers. Also some municipalities keep some containers or build some concrete receptacles within the city or town areas. Householders and commercial sectors put their waste into these containers. To collect waste from commercial areas or shops, individual bins or containers are placed in front of the shops or roadsides.



Generally, MSW is emptied directly into the trucks/tippers (Environmental Management Centre (EDI), 2007). Most of the time collected waste is dumped into open places.

2.7.3 Labour

Several workers engage in SWM services in the developing world. SWM need more workers to work in offices to make plans, to collect, to recycle, drive the vehicles and repair the vehicles. Higher level staffs are appointed to make plans or take decisions and they mostly work in the offices. Higher level staffs get some training to improve their work or work more efficiently. Other people are appointed for waste collection. Before collecting the waste these workers have to sweep the roads. Municipalities employ some people specifically to sweep roads. The waste collectors and sweepers are not well educated and work without any training. Due to economic problems labours in SWM are people without skills. Further, most of their work depends on human resources. This means generally many processes in SWM, carried out in developing countries are partly or completely manual processes such as road cleaning and waste collecting.

2.8 Roles and Responsibilities

The increasing volumes of waste being generated would not be a problem if waste was viewed as a resource and managed properly (UNEP, 2001). According to UNEP (2001), to solve solid waste related problems actors' roles and responsibilities are very important. Ngowi (unpublished) point out partnerships as an institutional arrangement and under this arrangement, it is important to define each actor's roles and responsibilities. As a result, it is easy to achieve the overall aim of PPP in order to meet the public needs.



Each actor involved in SWM has significant roles and responsibilities. It is very important to understand the roles and responsibilities of everybody or each sector in relation to the problem. Reddy and Srinivas (2009) noted that understanding the role of actors is imperative to come up with the best solution in providing quality services. There is, however, the possibilities of public/private partnerships for better solid waste management in Ghana.

2.9 Possibilities of Public/Private Partnerships for Better SWM

SWM practices in developed countries progressed from ‘no-system’ to an increasingly centralized ‘municipal system’. The classical approach to SWM, therefore, is to consider it an ‘urban planning’ problem or a public health issue. According to this approach, the municipal authorities are the main actors in the field (Baud and Shenk, 1994). Cities in developing countries generally followed this model and it is deemed that the responsibility for managing solid waste primarily rests with the municipal authorities. However, as described above, a number of private sector operators with varying capacity are adding valuable contributions to the SWM sector. The question then arises whether a synergy in the form of partnership between the two sectors may be achieved or not to deliver better SWM services? Formal public/private partnerships will increase the scope of activities of the private sector. This arrangement may improve the efficiency of the entire SWM sector, and create new opportunities for employment. On the other hand, any change in the present order may inevitably affect the lives of millions of most vulnerable and marginalized population in the cities of the developing countries. Therefore, careful analysis of theoretical and empirical data on public/private partnership as applied to SWM is much needed.



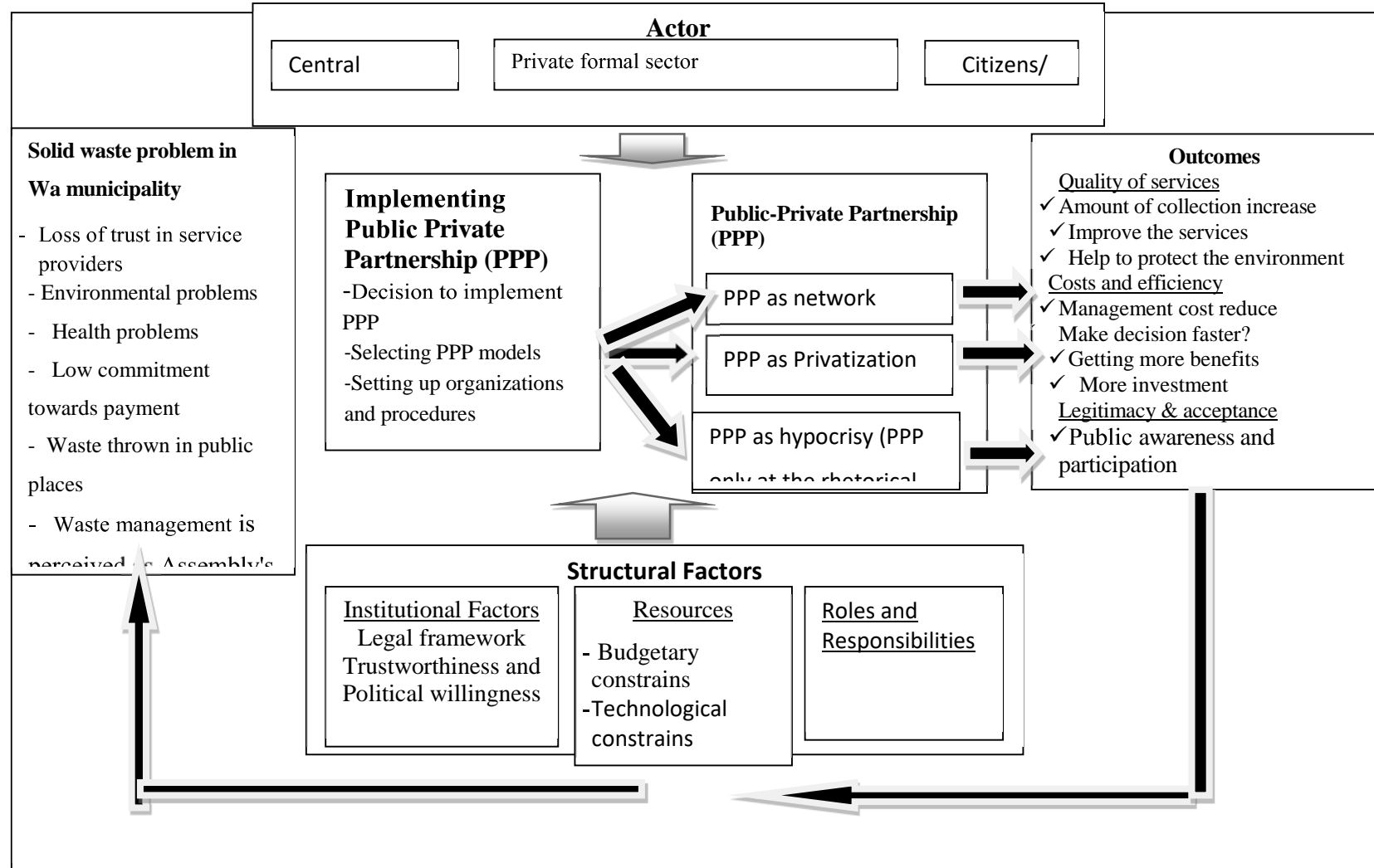
This will aid in ensuring effective public/private partnership and optimum resource utilization, and minimizing the related risks. Some theories of public/private partnerships with some emphasis on solid waste management are discussed below.

2.10 Analytical Framework of the Study

In this study, the researcher has translated a model used by Baklien (2000). In this present study, the researcher had integrated the theory of NPM and that of involved actors into the total framework. (See Fig



Figure 2.1: An Analytical Framework for Sustainable PPP in SWM in Wa Municipal



2.11 Conclusion

Solid waste as defined by the United Nations, (1988) as waste which is neither treated in waste water treatment plants nor discharged directly into ambient waters or air. Zerbock (2003) broadly defined Solid waste as encompassing non-hazardous industrial, commercial and domestic refuse including household organic trash, street sweepings, hospital and institutional garbage, and construction wastes. The management of solid waste in the form of transporting the waste differs from cities to cities and countries. Waste collection vehicles also range from trailers to specialized trucks equipped with waste compacting mechanism and because of the global increase in population; cities increasingly have to deal with an acute shortage of usable land to dispose waste. Some analytical frameworks of the subject matter were also discussed in this chapter and studies indicate that it is very difficult to implement the PPP in many countries. The reason is that, to deliver the PPP projects they have to improve institutions, processes, and procedures (UNECE, 2008).



CHAPTER THREE

STUDY AREA AND RESEARCH METHODOLOGY

3.1 Introduction

Methodology is one of the most important elements in any research. Research methodology refers to the various steps adopted by a researcher in studying an issue or a problem with certain object in view. According to (Blaxter *et al.*, 2002) all research involves the collection and analysis of data, whether through reading, observation, measurement, asking questions or combination of these or other strategies. This chapter focuses on the research techniques adopted for this study with the aim of achieving the research objectives. It elaborates the research design and provides details regarding the research design, population, profile of the study area, sampling frame, sampling techniques and sources of data. It also discusses the data collection methods, data analysis plans, ethical considerations, and validity and reliability.

3.2 Research Approaches

The mixed method approach of research was adopted for this study. The mixed method approach is a combination of both qualitative and quantitative methods of research.

3.2.1 Quantitative research approaches

Saunders et al. (2009) argues that Quantitative research provides simple descriptive of the variables involved, to establishing statistical relationships or effects among variables. Quantitative involves numbers where questionnaires are used for respondents to give a pre-determined answer by the researcher with inference from literature.



3.2.2 Qualitative research approach

Qualitative research on the other hand is used to gain an understanding of underlying causes, opinions and motivations which provides insights into challenges to develop idea or hypothesis hence appropriate for the intended study. It involves the words, feelings and facial expressions collected in a one on one interview format. Creswell (2009) strongly posits that the face-to-face approach to data collection allows the researcher to examine emotions and facial expression of respondent(s). This allowed the researcher to have an in-depth understanding of the phenomenon under study and thus made a detailed and informed analysis

Both methods are used to ensure a thorough research and to ensure that the weaknesses of using one method is made up for in the strengths of the other. Hence, the mixed method of research approach was adopted for the examination of the effectiveness of partnership between the Zoomlion Ghana Limited and the Wa Municipal Assembly.

3.3 Specific Research Design

The case study research design was used for the study. The choice of the case study research design was necessary to allow for a detailed examination of the operation of Zoomlion within the Wa Municipality. The operation of Zoomlion is similar thought the country but Wa municipality was chooses due to ease of the researcher to access data. The case study approach also allowed the examiner to be focused to do a detailed analysis on the PPP arrangement. Research design is a researcher's plan, structure and strategy developed to obtain answers to their questions and to control variance.



3.4 Target Population

The Wa municipal Assembly is the largest administrative capital which is also happens to be the Regional Administrative capital of the Upper West Region of the Republic of Ghana. The Municipality is one of the fastest growing municipalities in Northern sector Ghana with a total population of 107,214 and a total of 18,891 households (Ghana Statistical Service, 2012). There are about a total of six hundred and one (601) registered clients of the Zoomlion Ghana Limited in the municipality, Wa Municipal Assembly has a workforce of about seventy (70)whiles those of Zoomlion Limited operating within the Wa enclave are about forty-five (45)(Field Data, 2014). This figure was employed as the population of the study within which samples were taken.

A study population refers to a group of people or objects which form the subject of study. In simple terms, it consists of all elements or individuals, items or objects whose characteristics are being studied (Saunders *et al.*, 2007). Parahoo (1997:218) defines a study population as “the total number of units from which data can be collected, such as individuals, artifacts, events or organizations”.

3.5 Sampling Frame

Sampling frame is a list that constitutes the study population. The basic idea of sampling is that the unit selected represents the population. This means that in selecting some of the elements in the population, one can draw conclusions about the entire population. Cooper and Schindler (2006) suggest that ‘the sample frame is a representation of the elements of the target population that consist of a list of all elements of that population’. The sampling frame of this study encompasses all service providers (Municipal Assembly and Zoomlion Ghana Ltd) and service receivers (households currently registered with Zoomlion Ghana Ltd). Currently, there are 601 registered clients of



Zoomlion Ghana Ltd, 70 Assembly staff and 45 Zoomlion staff in the Wa Municipality.

Therefore the total sampling frame for the study is 716.

3.6 Determining the Sample Size

Based on the population and sampling frame above, the research adopted a mathematical formula for the purpose of determining the sample size. Taro and Yamane (1970) have suggested the following mathematical formula for determining a sample size (n):

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

Where, N is the total study population, and α is the error or confidence level

The conventional confidence level of 95% was used to ensure a more accurate result from the sample. Based on this, the error term would be equal to 0.05 using an estimated population of 716 and error margin of 0.05 the sample size was calculated as follows.

$$n = \frac{716}{1 + 716 (0.05)^2}$$

$$n = \frac{716}{1 + 1.5025}$$

$$n = 256.6$$

Therefore, the sample size for the study is approximately 257 people.

Hence, out of the estimated population of 716, a sample size of 257 is taken. The study selected 240 registered Households and beneficiaries of waste management through simple random sampling where each respondent was given equal chance of being selected.



A total of seven 7 Assembly and staff of the Sanitation unit and ten 10 Zoomlion staff were purposively selected based on specialist knowledge of the research issue, and their capacity as managers of sanitation in the Wa Municipality for an expert in-depth interview on the subject

Table 3.1: Methods and Sample size used in the Research

≠	Research Method	Research Tools	Frequency	Percentage
1	Quantitative	Questionnaires	240	93.40%
2	Qualitative	In-depth expert interviews	17	6.60%
Total	Mixed method		257	100%

Source: Field Data, 2015

3.7 Sampling Techniques

Sampling means selecting a group that represents the entire population. Sampling is considered because it reduces cost and resources that would have been used in studying the entire population. It makes a study more manageable in terms of resources and ensures that the objective of the study is covered as well.

3.7.1 Simple Random

The research deployed simple random sampling technique to select the 240 households to complete the questionnaires (see Appendix 1). To ensure representativeness, a simple random sampling strategy was used in which the list of all registered households within the municipality was obtained from Zoomlion Ghana Ltd. A random selection of households is drawn according to a proportionate distribution. Simple random sampling is a probability sampling procedure that gives every element in the target population, and each possible sample of a given size, an equal chance of being selected. As such, it is an equal probability selection method (EPSM).



3.7.2 Purposive Sampling

Purposive sampling is defined as a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a variety of criteria which may include specialist knowledge of the research issue, or capacity and willingness to participate. Some types of research design necessitate researchers taking a decision about the individual participants who would be most likely to contribute appropriate data, both in terms of relevance and depth.

As the name implies, purposive sampling involves the selection of settlements, organizations, and or respondents (households/individuals) who can best answer the research questions (Tsumasi, 2001). The key institutions charged with the responsibility for planning and managing solid wastes in the municipal level were purposely chosen. Moreover, purposive sampling technique was used to select 17 officials put together as service providers, 10 core staff from Zoomlion Ghana Ltd. and 7 respondents from Environment and Sanitation Unit of the Wa Municipal Assembly, bringing the overall sample size to the 257.



3.8. Sources of Data

The data required for the research was collected from two main sources; secondary and primary sources. These are further discussed in the sub-sections below:

3.8.1 Primary Sources

To ascertain the general solid waste situation, primary data were collected from households and strategic public institutions responsible for solid waste management in the municipality at the regional level and municipal. Primary data were particularly gathered from households, who were registered clients of Zoomlion Ghana Ltd. in the Wa Municipality through a household survey.

Structured questionnaires were used to collect data from households. In addition, interviews were conducted with the Environmental Health Department of the Wa Municipal Assembly and Regional office Zoomlion Company respectively on the partnership and institutional arrangements for solid waste collection in the municipality.

3.8.2 Secondary Data

The secondary data collected were gathered from academic journals, published books, newspapers, internet and articles. The essence of the primary and secondary data was that they helped in the validity of the study, the primary data gave firsthand information while the secondary data helped in crosschecking already existing works in the present study. Qualitative data, such as the oral account of the solid waste by household respondents and waste management agencies, and quantitative data, such as causes, effects, management and financial commitment in managing solid waste, were collected from relevant bodies for analysis, and interpretation.

3.9 Data Collection Techniques/Instruments

Combinations of techniques were used in data gathering. This combination of techniques was employed so that the strength of each method is maximized to overcome the weakness of using a single method (Sarandakos, 2005). Similarly, data collection tools help to provide a picture of the work environment. The goal is to help the researcher to clarify information, process knowledge, and identify opportunities for continuous improvement (Tague, 2004). The researcher gave a serious thought to the wording of individual questions. This was done to ensure that respondents answered objectively to the questions in the questionnaire.

The questions were in the open ended and closed or forced choice-format. In the open ended questions, the respondents formulated their own answers.



The closed or forced choice-format was easy and quick to fill and also minimized discrimination against the less literate (in self-administered questionnaire) or the less articulate (in interview questionnaire) (Leung, 2001).

The data collection process employed direct administration of different structured and unstructured questionnaires to a sample of households and beneficiaries of the service whereas face to face in-depth interviews were conducted for, official of the assembly, the Sanitation unit as well as Zoomlion Ghana Limited to solicit information relevant information. According to Frankfort *et al.* (1992), a personal interview is a face-to-face interpersonal interactive situation in which an interviewer asks respondents questions designed to elicit answers pertinent to the research hypothesis. An interview guide was used as instruments for discussing with other relevant bodies on the subject matter. The tools and techniques combine attributes of formality and informality, with written and unwritten questions and offered the opportunity to probe further and obtain valuable information from the respondent's knowledge on the subject under study.

Again, field observation was used. (Kumar 1999) defines observation as a purposeful selective and systematic way of watching and listening to an interaction or phenomenon as it takes place.

3.10 Data Analysis and Presentation

Data analysis is concerned with examining, categorising, and tabulating sources of evidence to address the initial proposition of the study. Analysing data is an essential component of case study research, but it is often difficult because the strategies and techniques for coding and testing this evidence are the least defined (Yin, 2009). Before analyzing the data, the data were cleaned up to remove possible errors to ensure accuracy and consistency.



The analysis was done in two phases namely, statistical (quantitative) and non-statistical (qualitative). Quantitative data were analyzed, summarized, and interpreted accordingly with the aid of descriptive statistical techniques such as total score and simple percentages. Statistical Package for Social Scientists (SPSS) was used. The scores for all questions were summed up and the average scores taken. Data were reviewed after the collection of filled questionnaires and compilation of data from the interview was performed. A critical analysis was done after which the data was interpreted and graphically represented.

Qualitative methods were more of open-ended and required the researcher to elaborate with words convincingly, concerning the motive. The approaches for qualitative analysis of data involved data reduction, coding and tabulation. However, secondary data from already published and unpublished works relevant to the study objectives were also reviewed.

3.11 Ethical Consideration

Ethical considerations is of utmost importance to this study given that the study involve the interaction and gathering of information from personal health issues and sometimes punishable offences and these data respondents are under no obligation to provide such information. Gathering information on the effective of PPP arrangement in solid waste management especially on the privately owned company (Zoomlion Ghana Ltd) required an adherence to strict research ethics. An introduction letter was submitted by the researcher to the various institutions to show the intent of the study and also enabled permission to start the research especially in the area of expert interviews for this research. The purpose of the study was explained to them and they were subsequently notified for the interview within two weeks after which the interview was administered for about three weeks due to the schedule of staff.

They respondents were made aware of the fact that the research is purely an academic requirement and as such information gathered will be treated with strict confidentiality. In this vein, ethical concerns such as voluntary participation, informed consent, confidentiality and anonymity were to be religiously observed.

3.12 Validity and Reliability of Data of the Work

Validity refers to the degree to which a test or an instrument measures or performs the task it is meant for. Reliability, on the other hand, refers to the dependability or the reproducibility of the instrument, that is, if it is consistently replicable. The validity and reliability of the instruments of this study were taken very serious.

Threads up to knowledge and fill gaps in the existing literature on the effectiveness of PPP arrangement in waste management especially in the WA Municipal Assembly. The researcher run a pilot questionnaire and interviews ensure that due diligence and critical research issues such as challenges in data collection, comprehension and analysis were dealt with at the preliminaries at stages. All relevant alternative interpretation to the data collected were analysed and all validity threat dealt with. The data was collected by the researcher in person and participants were made to understand the high ethical consideration necessary since this is an academic exercise and can easily be verified. The quantitative data was collected over a four week period.

3. 13 Profile of Study Area

Wa is the Regional capital of the Upper West Region of Ghana and doubles as the capital town of the Wa Municipality. The Municipality is one of the fastest growing municipalities in Northern Ghana with a total population of 107,214 and a total of 18,891 households (Ghana Statistical Service, 2012).

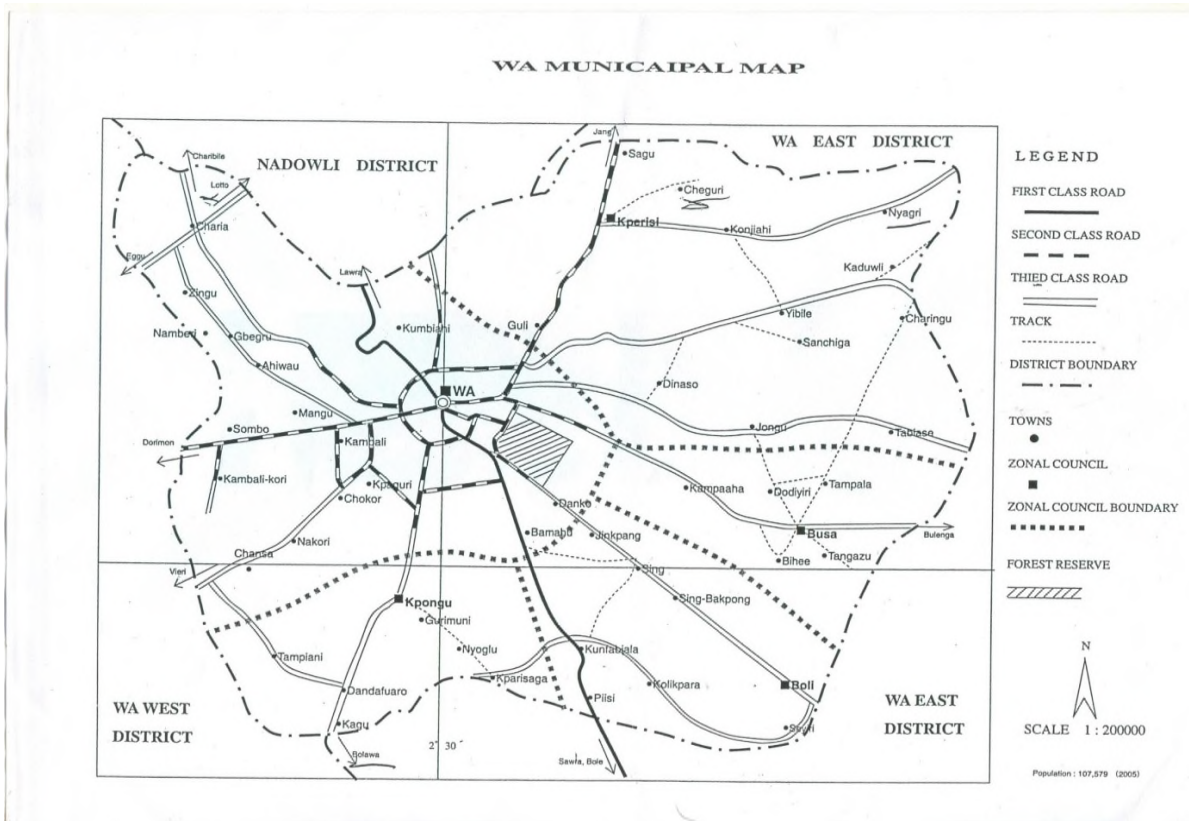


Due to increasing population in the municipality, the quantity of waste generated has increased from an estimated 44,403 metric tons in 2000 to 48,246 metric tons in 2010. The responsibility for waste management within the municipality is shared among the Environmental Health Departments of the Wa Municipal Assembly, which plays a regulatory role for Zoomlion Ghana Ltd.

Wa Municipal Assembly is one of the 11 District/Municipal Assemblies that make up the Upper West Region (UWR) of Ghana. Wa Municipal Assembly was upgraded from the then Wa District in 2004 with Legislative instrument (L1) 1800 in pursuant of the policy of decentralization started in 1988. Under section 10 of the Local Government Act 1993 (Act 426), the assembly exercises deliberative, legislative and executive functions in the municipality. The Wa Municipal Assembly shares administrative boundaries with Nadowli-Kaleo District to the North, Wa East District to the East and South and the Wa West District to the West and South. It lies within latitudes 1°40'N to 2°45'N and longitudes 9°32' to 10°20'W (Figure 3.1).



Figure 3.1: Map of the study area



Source: Wa Municipal Assembly, Planning Department.

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Wa Municipal Assembly has its capital as Wa which also serves as the regional capital of the Upper West Region. It has a landmass area of approximately 234.74 square kilometres, which is about 6.4% of the region. The Assembly is empowered as the highest political and administrative body charged with the responsibility of facilitating the implementation of national policies. The implications of the location of the municipality for development include; Enhancing bilateral trade and commerce with the Francophone countries. Wa town also has the potential to growth and be upgraded into both an industrial and commercial hub for the north-western corridor of Ghana.

3.14 Conclusion

The chapter focused on the research methodology employed for the study. A mixed method of approach of study was adopted using the case study as the specific research design. Two hundred and fifty seven (257), data respondents were engaged and out of these 240 were quantitative and 17 were through one-on-one face-to-face in-depth expert interview. A total of 7 Assembly staff of the Sanitation unit and 10 Zoomlion staff were purposively selected based on specialist knowledge of the research issue, and their capacity as managers of sanitation in the Wa Municipality.

The data of study will be analyzed in two phases namely, statistical (quantitative) and non-statistical (qualitative). Quantitative data were analyzed, summarized, and interpreted accordingly with the aid of descriptive statistical techniques such as total score and simple percentage. Microsoft Excel and Statistical Product and Service Solution (SPSS) were used. The approaches for qualitative analysis of data involved data reduction, coding and tabulation.



CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter presents a review of the mandates and policy framework, an analysis of findings and finally the discussions. In general, the chapter is divided into major parts. The first part assesses the socio-demographic characteristics of respondents. The second part presents data on the source and types of waste, benefits from a PPP arrangement in waste management and factors affecting the effectiveness of PPPs in waste management and its sustainability. It also explores the barriers to private sector participation in solid waste management in the municipality. The findings of the study are presented in the form of tables and figures for quantitative and words in qualitative. Demographic characteristics of the respondents were also presented.

4.2 Demographic Characteristics of Respondents

Demographic data or characteristics of a particular population examine the socio-cultural and environmental factors that affect the economic empowerment of the residents in terms of poverty reduction and local economic resources mobilization. This has a direct or indirect relationship with the amount of waste that could be generated and how this waste is subsequently disposed of.

The demographic data was collected in order to have an in-depth understanding of the nature of persons that lived in the municipality in terms of their level of income, age, educational level, gender, marital status, occupation, religion, ethnicity as well as other physiognomies. The aim is to determine how these characteristics influence solid waste generation and management among others. Only the relevant ones to this research were presented in the work.



Below is a table showing the categorisation, frequencies and various percentages of the demographics of the sample size. This is showed in Table 4.1 below

Table 4.1: Respondents Demographic Data

	Frequency	Percentage%
Gender		
Male	74	28.79%
Female	183	71.21%
Age		
Between 20-30	119	46.30%
Between 31-40	38	14.79%
Between 41-50	67	26.07%
Above 51	33	12.84%
Educational level		
No Formal Education	36	14.01%
Primary education	97	37.75%
Secondary education	51	19.84%
Tertiary	73	28.40%
Religion		
Moslems	175	68.10%
Christian	50	19.46%
Atheist	2	0.78%
Traditionalist	30	11.66%
Income Levels per month		
Below 100	26	10.12%
Between 100-500	55	21.40%
Between 500-1000	70	27.24%
Above 1000	106	41.24%
Total	257	100%

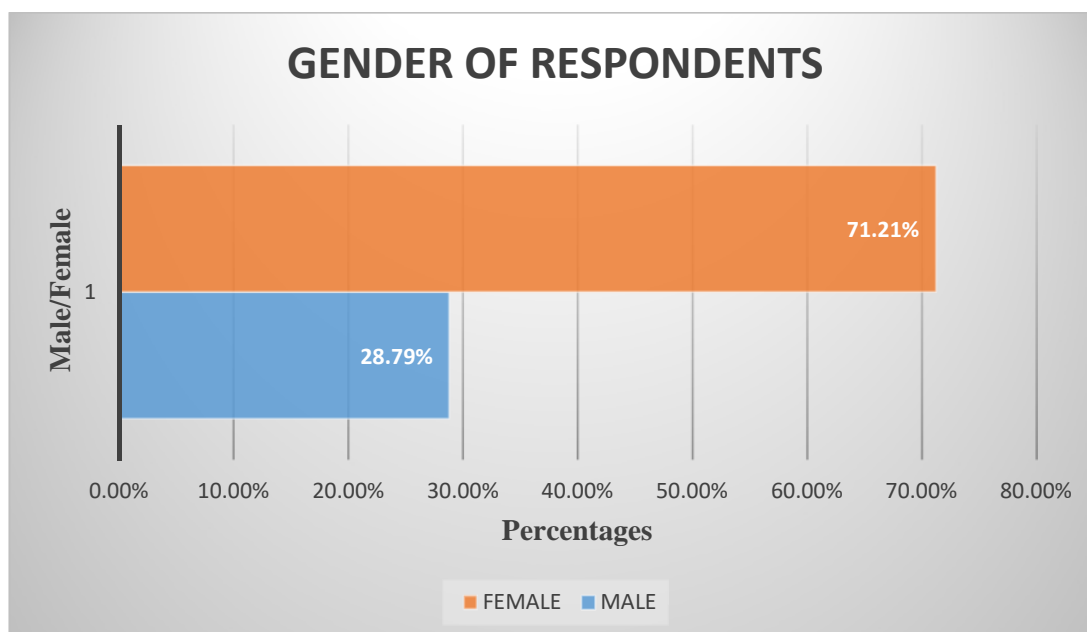
Source: Field Data, 2014

4.2.1 Gender of Respondents

Gender of data respondents attempts to look at the proportion of males to females that were data respondents for this study. This was also to ensure and examine which category of gender is more conscious of sanitation issues and waste arrangement. This is presented in figure 4.1



Figure 4.1 Gender of Data Respondents



Source: Field Survey, 2014

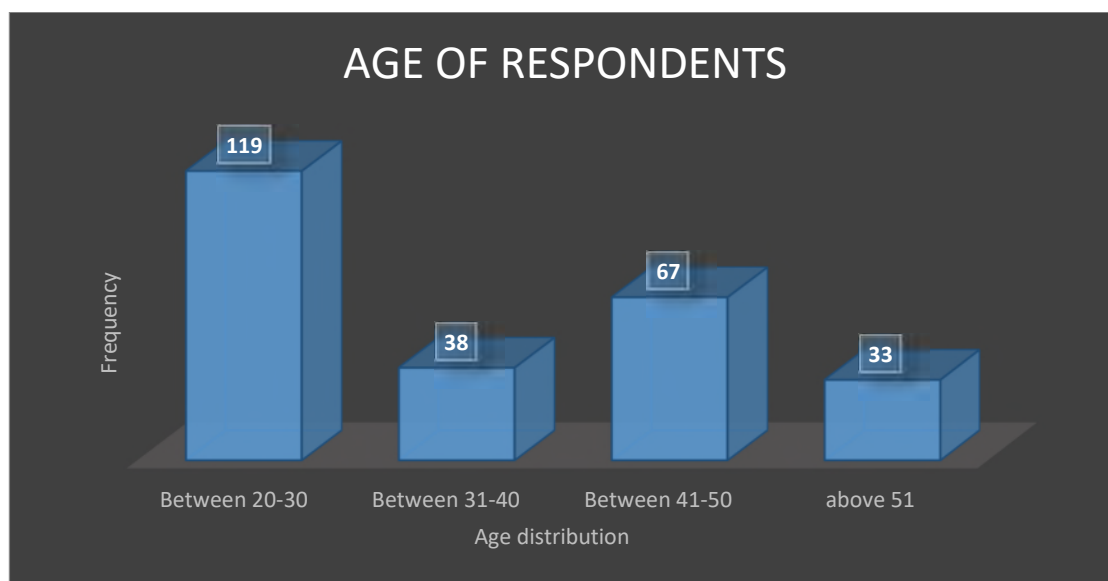
Figure 4.1 shows the data on gender of the sampled population. There are about 71.21% of the sampled population that are males while only 28.79% were women. This is a fair and general representation of the national data which showed that there are actually more women than men. More importantly, this data shows how more concern women are in health and sanitation matters as compared to men. This may be due to the unwillingness of most men or the notion to see domestic chores as reserved solely for women. The GSS, (2010) census data puts women at 52% and males at 48% yet, even though there are more females in this research than men, more males are gainfully employed and are in top managerial positions than women within the municipality. The difficulty for this situation in the men take decision about areas that they are not too keenly interested in or have little knowledge as compared to their female counterparts.



4.2.2 Age Distribution of Respondents

Age is fundamental in the determination of levels of experience and understanding of social issues. It defines the rules of eligibility or ineligibility for inclusion or otherwise in many facets, especially areas such as solid waste generation and management where legal principles are applied. The ages of respondents were categorised into four cohorts. This was to ensure that the views expressed by the research participants in the survey reflected their differential experiences and opinions. Thus, the age cohorts were categorised as between 20-30, 31-40, 41-50 and above 51 for all the respondents as can be seen from figure 4.2.

Figure 4.2 Age Distribution of Respondents (%)



Source: Field Survey, 2014

From Table 4.2 above, out of the 257 data respondents for the research carried out within the Wa Municipal Assembly, majority constituting about 46.30% (119) are between the ages of 20-30, while 14.79% attained the ages of 31-40. Another 26.07% of the respondents are between the age group of 41-50 years whereas 12.84% of the respondents fall within the age group of above 50.



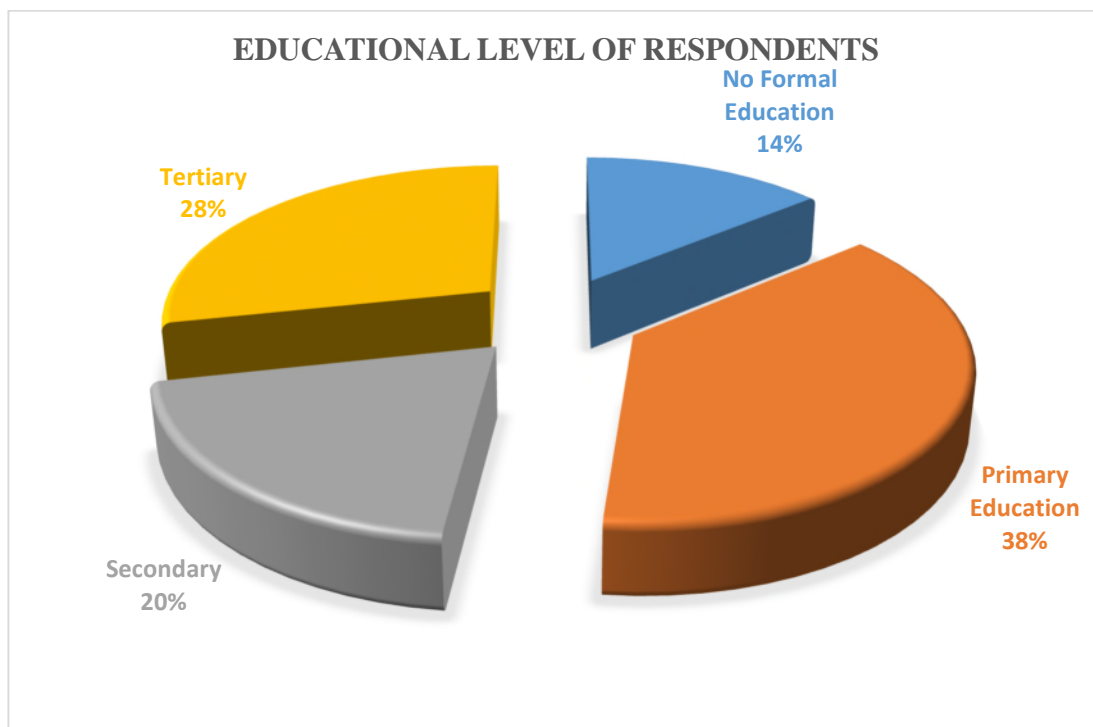
This data showed that between adolescent and up to about thirty years, young people are particularly careful about their neatness as well as that of their surroundings, but after a certain time, their focus shift to other things such as marriage or childbearing. As the data showed, they become interested in waste management again after 40 years where they may have acquired most basic necessities and aspirations in life

4.2.3 Educational Level of Respondents

Education, both formal and informal play a pivotal role in shaping the lives of individuals. Many writers, such as Garba (2002) and Odeklunle (2001 cited in Dery, 2014), have demonstrated that there is a positive correlation between educational attainment and waste management. The more individuals are educated, the less the errors they would commit in carrying out a task. The impact of education on the respondents in waste generation and management is therefore significant. The survey sought to find out the educational background of all the respondents (Figure 4.4) so as to gain an insight into their level of understanding of proper waste management practices and effectiveness of PPP arrangement on the matter.



Figure 4.3: Educational Level of Respondents



Source: Field Survey, 2014

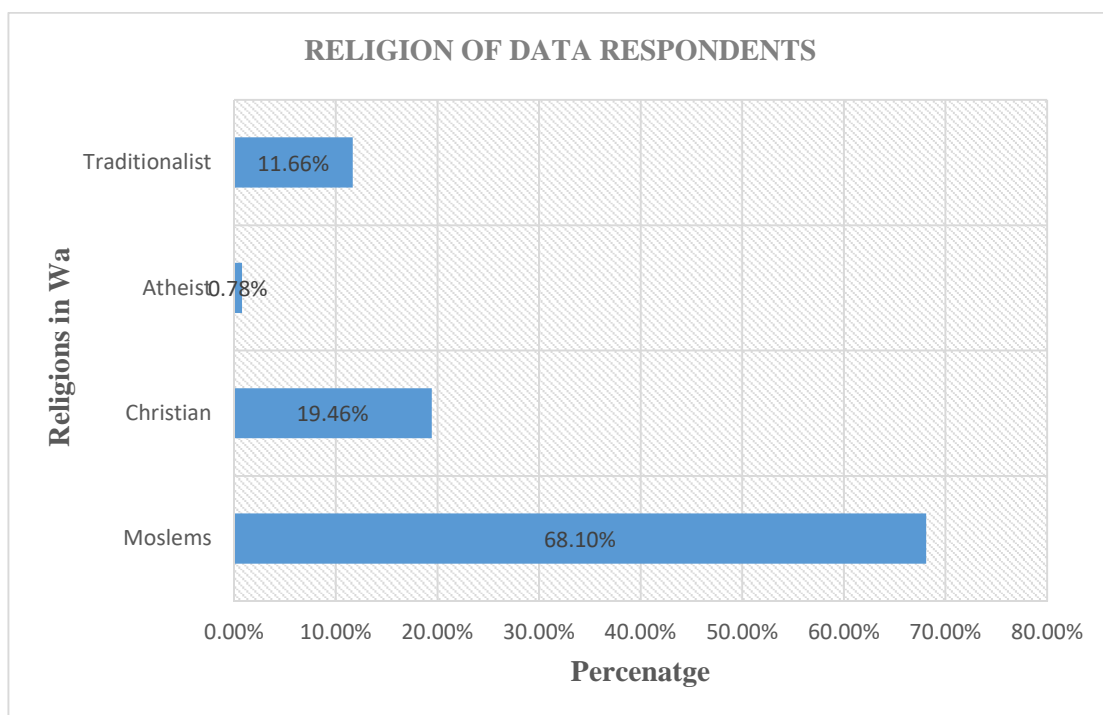
From Figure 4.3, a majority of the respondents, constituting about 38%, have only primary education. This means they either have stopped school at a lower primary or were unable to go to Junior High School. However, about 14% of the target population has no form of formal education. Notwithstanding, about 20% and approximately 28% of the sampled population have either reached Secondary School or have attended the tertiary level (diploma, bachelors' degrees, and masters' degrees). The implication of the 14% that has no formal education is reflected in their understanding and appreciation of waste management issues. Because it's more difficult for those persons to be convinced about the health implication of some of their actions or inactions.



4.2.4 Religion

There are two major religions in Ghana. This research sought to understand if the religious beliefs of a person which is sacred have an influence on his personal hygiene and the way and manner in which he/she treat his environment and surroundings. This is shown in figure 4.5 below.

Figure 4.4: Various Religious Believers of Data Respondents



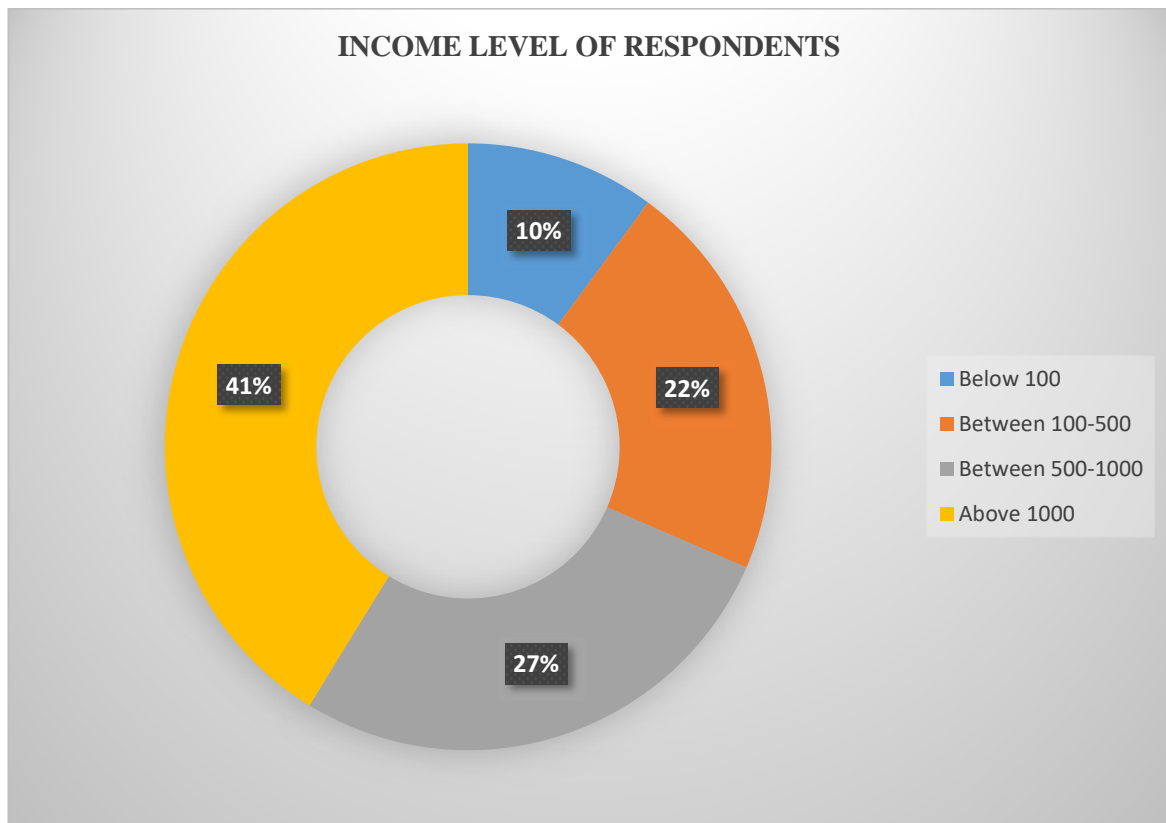
Source: Field Survey, 2014

From figure 4.4 above, there are about 0.78% of persons who believe in the existence of no God whiles over 99% of the population believes in the existence of God in one form or another. Out of this 99% about 11.66% of the population that however practice the African Traditional Religion. Whiles 19.46% are Christian, the majority of the population are Moslems (Islam) 68.10%. This is not surprising because Northern Ghana for that matter Upper West is predominantly, a Moslem community, especially with the Wa Municipality.

4.2.5 Total Estimated Income Level per Month

The data on the total estimated income per year is to understand and categorize the data respondent into lower or middle-income earners. This is critical to identify their spending pattern and how likely to identify the critical condition of those living on less than a dollar a day. This is because, the more money you have the more you spend, and the more you spend the more likely you are to generate more waste.

Figure 4.5: Total Estimated Income Level per Month



Source: Field Survey, 2014

Figure 4.5 shows the data on total estimated income of respondents. In terms of the estimated incomes of residents, there are over 10% of respondents who indicated that they earned below GHC 100 on the average per month while about 22% of the sampled population for this study indicated that they earned incomes between GHC100-GHC500. Another 27% earned a living on incomes between GHC 500-GHC1000 while the majority of about 41% about GHC 1000(250 USD @4 to a dollar). This is shown in figure 4.6 above.

Most of the respondents were earning income about GHC1000. This is not surprising at all as most of these persons have some form of at least a tertiary education or secondary. And with the recent labour agitations in Ghana and the subsequent implementation of the Single Spine Salary Structure (SPSS), most government or public worker with a qualification at or above tertiary approximately earned above GHC1000. This may even be a small amount of money for business women who plow between Kumasi, Techiman, and Accra for their business on almost daily basis. And thus, if their income is anything to go by, it can be inferred that waste generation is on the increase because more people now have more resource at their disposal couple with the issue of too much plastic material on the market.

4.3 Sources and Types of Solid Waste Generated in the Municipality

Solid waste management has been an issue in urban areas since modern societies and households generate more solid waste than early human settlers ever did. Daily lives in these urban settlements generate several pounds of solid waste per consumer, not only directly in the home, but indirectly in factories that manufacture goods purchased by consumers.



The types of waste or garbage generated from households of the Wa Municipality, as revealed by the study, include: large amount of organic waste (kitchen waste, vegetable waste), reasonable amounts of toxic waste (old medicines, chemicals, bulbs, spray cans, fertilizer and pesticide containers, batteries and more), recyclable waste (paper, glass, metals, plastics) among many others as detailed in Table 4.1.

Table 4.2: Sources and Types of Solid Waste Generated from the Wa Municipality

Sources of wastes	Typical waste generators	Types of solid wastes generated
Residential	Single and multi-family dwellers	Food wastes, paper, cardboard, plastics, textiles, leather, wood, glasses, metals, ashes, batteries,
Construction and Demolition	New construction sites, road construction/repairs, renovation sites, demolition of buildings etc.	Wood, steel/metals, concrete, dirt, dust.
Agriculture	Crops, feedlots, farms etc.	Spoiled foods, fertilizers, pesticides, agriculture wastes, hazardous waste.

Source: Field Data, 2015

Table 4.1 shows the various sources and types of waste generated in the Wa Municipality. These waste generated by the majority of registered Zoomlion clients include: residential, commercial, institutional, construction, demolition, and agricultural wastes. The residential wastes, which consist of food wastes, paper, cardboard, plastics, textiles, leather, wood, glasses, metals, ashes, and batteries, are generated by single or multi-family dwellers. Construction and demolition materials, etc. are generated by light-manufacturing, fabrication, plants and construction sites.



Construction and demolition wastes, consisting of wood, steel/metals, concretes, dirt, dust, etc. are generated by new construction sites, road construction/repairs, renovation sites, demolition of building etc., agricultural wastes found in the municipality include spoiled foods, fertilizers, pesticides, insecticides, etc. are generated from crops, feedlots, gardens/farms among several others.

4.3.1 Methods of Solid Waste Disposal by Households

The disposal of solid waste is a problem in the Wa Municipality. This problem continues to grow with the growth of population and development of local industries. Disposal of waste in open pits has become routine in many places within the Wa Municipality. Semi-solid or solid wastes created by human or animal activities are disposed of because they are dangerous, hazardous and useless. Most of the solid wastes like paper, plastic containers, bottles, cans, and even used cars and electronic goods are not biodegradable, which means they do not get broken down through organic or inorganic processes. Thus, when they accumulate, they pose a health threat to people and the decaying waste also results in unhealthy, dirty and unsightly urban areas. The decayed solid waste also causes damage to terrestrial organisms, while also reducing the uses of the land for other more useful purposes. The various methods of disposing of semi-solid or solid waste in the Wa Municipality are outlined in Table 4.3.



Table 4.3:1 Methods of Solid Waste Disposal by Households

Variables	Frequency	Percent
Burning	48	21.1
Burying	132	57.9
Refuse dump	36	15.8
Composting	12	5.3
Total	228	100.0

Source: Field Survey, 2015.

It could be inferred from Table 4.3.1 that majority of the respondents, constituting about 57.9%, before the operations of Zoomlion Ltd., disposed of their refuse through burying. This was regarded by respondents as the most effective disposal method since disposed waste is totally covered and prevents environmental pollution. About 48(21.1%) of respondents utilized burning as their refuse disposal method while 36(15.8%) of the respondents dispose of their household wastes through opened refuse dumps and 12(5.3%) of respondents who had back yard gardens employed composting as specific way of turning waste generated into fertilizer for their crops.

Burning as a method of waste disposal used to be a common way of disposing solid waste in the Wa municipality but because it causes a lot of environmental problems, communities in an attempt to avoid these problems developed sanitary landfills and techniques towards proper disposal of waste. These landfills accept whatever households dump.



After the launch of Zoomlion's waste management and treatment products in the Wa Municipality, majority of households in an attempt towards achieving a proper, efficient and effective method of waste disposal has blended the traditional methods of waste disposal (burning, burying, open refuse dumping etc.) with the new Zoomlion waste bins/ containers to dispose of their household waste. This is confirmed by a majority of the respondents as a man in Wa puts it:

“We dispose off waste in bin/containers distributed by the assembly together with Zoomlion. We pay some fee when Zoomlion is coming for the waste”. (Client, May, 2014).

In the past, dumping was the most used methods to dispose municipal waste because the generators were often unaware or unconcerned about the potential effects of the waste. Communities in the developed world realized that dumping and burial of waste could cause many problems and they developed other effective and efficient techniques to treat and manage their waste.

The most common techniques were creation and development of landfills, incineration, composting and recycling which confirms the findings of Cable and Cable (1995). Burning creates a thick smoke that contains carbon monoxide, soot and nitrogen oxides, all of which are hazardous to human health and degrade urban air quality. Combustion of polyvinyl chlorides (PVCs) generates highly carcinogenic dioxins (Evan, 1994).

4.3.2 Method of Solid Waste Disposal

There is a growing concern all over the country about the indiscriminate disposal of solid waste into places such as gutters, rivers, streams and other open drains.



From the 2010 Population and Housing Census, 44.6 percent of the households in the Wa Municipality disposed of their solid waste in a public dump (container) while 23.6 percent disposed them in public dumps (open spaces) (Table 3.1). Also, 17.6 percent of the household had chosen to dump their solid waste indiscriminately and this behaviour calls for concern and the need for the Municipal Assembly to act to forestall any looming public health disaster. About 4.3 percent of the households' solid waste was collected by Zoomlion while 1.6 percent of households buried the solid waste and the remaining 0.5 percent disposed of the solid waste by other means.

In the urban communities in the Wa Municipality, the overall disposal of solid waste is largely by public dump (container) constituting 55.9 percent, followed by public dumps (open spaces) with 15.7 percent and indiscriminate disposal of waste accounting for 15.3 percent. On the other hand, in the rural part of the municipality, disposal of solid waste was mainly by public dumps (open spaces) accounting for 57.7 percent, followed by the indiscriminate dumping of solid waste (23.4%) and 15.9 percent for public dumps (containers).



Table 4.4: Methods of solid and liquid waste disposal by type of locality

Method of waste disposal	Total country	Region	District			
			Total N	%	Urban %	Rural %
Solid waste						
Total	5,467,054	110,174	18,891	100.0	100.0	100.0
Collected	785,889	5,123	815	4.3	4.4	4.1
Burned by household	584,820	6,518	1,490	7.9	7.0	10.1
Public dump (container)	1,299,654	13,969	8,425	44.6	55.9	15.9
Public dump (open space)	2,061,403	40,538	4,451	23.6	15.7	43.5
Dumped indiscriminately	498,868	39,635	3,326	17.6	15.3	23.4
Buried by household	182,615	3,515	293	1.6	1.1	2.6
Other	53,805	876	91	0.5	0.5	0.4
Liquid waste						
Total	5,467,054	110,174	18,891	100.0	100.0	100.0
Through the sewerage system	183,169	1,746	742	3.9	3.5	5.1
Through drainage system into a gutter	594,404	3,573	1,961	10.4	11.8	6.7
Through drainage into a pit (soak away)	167,555	3,633	1,190	6.3	6.0	7.2
Thrown onto the street/outside	1,538,550	71,344	10,116	53.5	51.9	57.7
Thrown into gutter	1,020,096	3,958	1,452	7.7	9.4	3.3
Thrown onto compound	1,924,986	25,348	3,343	17.7	16.9	19.6
Other	38,294	572	87	0.5	0.5	0.4

Source: Ghana Statistical Service, 2012.



4.4 Benefits of PPP arrangement in Solid Waste Management.

This objective examines the various forms of benefits that could be derived from not only waste management. But the engagement of Public private partners in the management of waste. It analysis the positive of this symbiotic relationship.

4.4.1 Benefits of PPP arrangement in Solid Waste Management in the Wa Municipality

Effective public-private partnerships are associated with benefits. These benefits however hinges on each party fulfilling its commitment to the partnership. The majority of the Zoomlion staff, constituting about 80%, stated that public-private partnership ensures efficient use of resources. Other Zoomlion staff regarded pre-financing, private sector participation, and motivation as the benefit of public-private partnership. One man in his capacity as a staff of Zoomlion argued that:

“As partners, who have made commitments to each other in the partnership agreement, we make sure that we utilize our resources efficiently to achieve effective waste management and further consolidate the partnership. (Zoomlion Staff, May 2014).

However, most respondents, constituting about 60% of the total respondents, argued that pre-financing is the major benefit of private-private partnership whereas the remaining 40% of the respondents claimed that the efficient use of resources and private sector participation and motivation are the benefits of PPP. A client, an Assembly-member of Konta revealed that:

“Private companies have funds readily available for waste management and Zoomlion is one of them. You know the assembly uses internally generated funds and common funds for its projects and these sources,



sometimes, are not very reliable and hence Zoomlion can pre-finance waste management services and when these assembly funds come in we also fulfill our part". (Client, May 2014)

In support of this view, another client who is the Assembly-member of Kambali said:

"Because of the partnership agreement and its binding status on each of the parties, there is usually the efficient use of resources for waste management, in that all parties show commitment". (Client, May 2014).

Furthermore, the staff of Zoomlion Ghana Limited in the Wa Municipality claims that PPP provides a holistic approach to solid waste management. Others saw PPP as a reducer of government burden and also providing an open and transparent way of waste management in the Wa Municipality.

The views of the staff of Zoomlion Ghana Limited confirm the views of a majority of the respondents for the study, as they opined that PPP served as a holistic approach to solid waste management in the municipality. Few, however, saw PPP as a provider of private sector participation in waste management. Tables 4.5 and 4.6 represent the views of Zoomlion staff and Assembly Members on PPP.

Table 4.5: The Opinion of Zoomlion Staff on PPP in solid waste management

Variables	Frequency	Percent
Holistic Approach to solid waste management	7	70.0
It is open and transparent	1	10.0
Reduces Government's burden	2	20.0
Total	10	100.0

Source: Field Survey, 2014.



Table 4.6: Wa Municipal Assembly staff opinions about PPP in solid waste management

Variables	Frequency	Percent
Holistic Approach to solid waste management	4	57.1
It provides private sector participation	3	42.9
Total	7	100.0

Source: Field survey, 2014

The study confirms Baud *et al.* (2001) findings which used a 9-point indicator system combining ecological, socio-economic and public health concerns to assess how alliances between the public and private sector in solid waste management contribute to sustainable development and concluded that alliances could help solve the problem of disposal and the performance of the landfills.

Similarly, Obirih-Opareh and Post (2002) assessed the quality of public and private modes of solid waste collection in Accra has also been buttressed by the study by revealing that private participation in solid waste collection has benefited consumers in terms of wider coverage and service reliability but has also increased environmental dangers and worsened labour conditions. This study found that majority of the respondents, constituting about 70%, saw the role of Zoomlion in delivering solid waste management services as very satisfactory as asserted by one Assembly Staff:

“Zoomlion is doing as expected. We don't see waste stagnant at a particular place for long these days. There has been an improvement in waste collection in our municipality and it is good for the health of our people.” (Assembly Staff, May 2014).

Moreover, in evaluating the company's activities, with regards to the PPP, a majority of the respondents constituting about 57.1% of the overall respondents, were satisfied with the activities of PPP and solid waste management in the Municipality. Refreshingly, all Assembly Staff, also in their evaluation of Zoomlion, saw their role in delivering solid waste management services as satisfactory. Vavra (1997) and Boyne (2002) posit that quality assessment of waste management services is very relevant in view of the health consequences associated with poor quality waste management services. Thus, the general public and customers of waste management firms are more concerned about the quality of services delivered.

Since residents pay user charges for services delivered, they expect the services to be reliable and refuse sites to be devoid of waste overflow, flies, and rodents. In view of this, customer satisfaction surveys have become the leading criteria for determining the quality of services delivered to customers and a key performance indicator for both public and private organizations in the Wa Municipality.

The collection of waste in the Wa Municipality is regarded as the crucial first step in the chain of waste management. It is a labor intensive phase and, therefore, also the most expensive one in the waste management process which affirms Raj (2000) postulations.

Interestingly, there was unanimity of respondents on the usefulness of private sector involvement in the solid waste management service provision. They insisted that government and its assemblies cannot do it alone.

The study also confirms Katusiimeh *et al.* (2012) assertion that the effectiveness of the operations of public and private entities in solid waste collection in developing countries is more effective than the public sector alone.

The respondents of Zoomlion Ghana Limited, however, pointed out that clients of both public and private actors perceive the problem of solid waste to be very serious. The findings from these studies imply that waste management still continues to be a major concern for many people, even with the participation of the private sector.

Solid waste management has become a major challenge in many cities in the developing world where hitherto waste management had been the sole responsibility of central government. The problems of solid waste in these countries have been worsened with rapid urbanization and growing numbers of slums resulting in major problems relating to public health, environmental pollution and aesthetic nuisance (Katusiimeh *et al.*, 2012).

Again, all respondents confirmed that the PPP model was a suitable model in the municipality and the people accepted it as one respondent from the regional Zoomlion office of in Wa puts it:

“People are happy about our collaboration with government and the assembly. They always say to us this was the kind of partnership model we’ve been yearning for several years. They lamented on the mediocre performance of such partnerships in the past. They have seen improvements since our partnership came into being. (Zoomlion Staff, May 2014).

Subsequently, a majority of the respondents constituting about 70.0% of the total Zoomlion staff interviewed, and 57.1% of the Wa Municipal Assembly staffs interviewed confirmed that the role of Zoomlion in creating PPP models was effective. This affirms Longe *et al.* (2009) assertion that the public sector was commonly reported to be constrained due to lack of managerial and technical capacity, cumbersome procurement



procedures, and inadequate financial resources. These constraints have resulted in an increased interest in PPPs in urban solid waste management in many developing countries in recent years with the main objective of improving efficiency in waste collection, reducing costs and reforming the weak performance of the public sector (Joness and Pisa, 2000; Rakodi, 2003).

Waste management is a multi-stakeholder task from the household level to the state level. Most respondents constituting about 70% were of the opinion that households must encourage the use of waste containers to help improve waste management efficiency as ascribed a woman in Dobile;

“We people are the government. So we should not always look up to any authority or the private sector to carry the burden of providing waste management services. The people from the household level must start the waste management initiative in their homes through the encouragement of the use of waste containers provided by the assembly and Zoomlion Ghana Limited. (Client, May 2014)

These findings conclude that Public Private Partnership had improved solid waste management services in the Wa Municipality.

4.5 Challenges or Barriers to Private Sector Participation in Solid Waste Management

Challenges in any facet of life impede progress. Zoomlion staff, in their view of current problems in solid waste management in the municipality (Table 4.6), stated that the major problems of solid waste management in the WA Municipality are that solid waste is not a priority of local government; hence it is not given proper budgetary support and staff, with a mean of (2.6842), and waste management workers are seldom protected



from direct contact and injury and are exposed to hazardous and medical waste which is co-disposed with municipal wastes (2.5263). Also, Zoomlion lack or absence of skilled technical waste personnel scoring a mean of (2.4211) and low recovery rate and waste diversion from landfills because of low implementation of segregation at source, recycling and composting (2.4737) was discovered as some of the problems but not severe as claimed by a staff of Zoomlion in Wa:

“The skilled personnel to collect and manage waste in this municipality are inadequate. Considering the house and waste ratio to the personnel to manage waste, then there is a major challenge”. (Zoomlion Staff, May 2014).

However, the least problems the municipality faces were uncontrolled gas emissions from decomposition of organic wastes in open dumps and untreated wastes polluting surrounding soil and water bodies, with a mean of (2.1053), lack of appropriate disposal sites because of costs, social acceptability and waste generation rates (2.0526) and indiscriminate dumping of wastes in rivers and bodies of water, which contaminates surface and ground water supplies (2.1579). The study supports EPA (2004) findings that all kinds of wastes, regardless of their nature, are being dumped indiscriminately into water bodies, depressions, sand pits, old quarries, beaches, drains and even in certain areas, along streets. A Zoomlion staff said that:

“We don’t understand why people dump waste in water bodies here. We see a lot of waste in water bodies in recent times and it’s beyond our understanding since some of these water bodies serve as drinking water sources to some of the residents here”. (Zoomlion Staff, May 2014).



Table 4.7: Barriers to Private Sector Participation and municipal solid waste management

Variables	Mean	Std. Deviation
Uncontrolled gas emissions from decomposition of organic wastes in open dumps and untreated pollutes surrounding soil and water bodies	2.1053	1.02281
Indiscriminate dumping of wastes in rivers and bodies of water which contaminates surface and ground water supplies.	2.1579	1.27033
Low recovery rate and waste diversion from landfills because of low implementation of segregation at source, recycling and composting.	2.4737	1.18887
Waste workers are seldom protected from direct contact and injury and are exposed to hazardous and medical wastes which are co-disposed with municipal wastes.	2.5263	1.18887
Lack of appropriate disposal sites because of costs, social acceptability and waste generation rates.	2.0526	1.19354
Lack or absence of skilled technical waste personnel in local government	2.4211	1.04434
Solid waste is not a priority of local government, hence, not given proper budget and staff	2.6842	1.08100

Source: Field survey, May 2014



Again, most Zoomlion staff said the municipality’s current solid waste management problem emanated from the poor attitude of the residents. Also, inadequate dumping site, inadequate communal containers and untimely disposal of waste were ascribed to as contributory factors to the municipality’s current solid waste management problems. A Zoomlion staff lamented on some residents’ poor attitudes towards hygiene and waste management as:

“I don’t know whether people’s health concerns them. Because when you observe how unhygienic some residents are, you wonder whether they control illnesses and infections; hence they are not vulnerable to them. People make waste and dump them in places where it could pose threat

to their health. Until people change their attitudes towards hygiene and waste management, there will always be problems". (Zoomlion Staff, May 2014)

Moreover, the respondents attributed the poor attitude of residents towards hygiene and waste management to inadequate educational programs, lack of funds, the high cost of containers and equipment constraints. Kendie (1999) argues that the recent upsurge in waste disposal problems stems from the fact that attitudes and perceptions towards wastes and the rating of waste disposal issues in peoples' minds and in the scheme of official development plans have not been adequately considered as one respondent (Zoomlion worker) puts it:

"I believe it is out of lack of proper education that some residents have poor attitudes towards waste management and hygiene. If people have knowledge on the detrimental effects of waste on their health, I am sure their attitudes and behaviours towards hygiene and waste would have been positive". (Zoomlion Staff, May 2014)



Assembly men also gave their views on the current and primary problem with solid waste management in their municipality. Majority of the assembly-men constituting about 60%, stated that the current and primary problem with solid waste management in their municipality was due to the inadequacy of communal containers. Also, untimely disposal of waste was viewed by some Assembly Members as the current solid waste management problem in the Wa Municipality.

From one Assembly staff revealed that:

“My residents attribute the indiscriminate dumping of waste in my community and the municipality as a whole to the inadequacy of containers to dump the refuse in. it's been a major challenge in the municipality”. (Assembly staff, 2014)

The study affirms Post and Obirih-Opore (2003) view that performance and weakness in waste management institutions serve as the bane for waste management problems. Consequently, respondents especially staff of Zoomlion observed the following variables as the human and natural causes of the problems of the municipal solid waste management in the Wa Municipality: The local government lack comprehensive plans with a mean of (2.9474), Creation, monitoring and enforcement of waste management ordinance (2.7368) and not-in-my backyard syndrome - This NIMBY syndrome (2.5789) were the major human and natural causes of the problems of the municipal solid waste management in the WA Municipality. A Zoomlion staff said:



“I have not witnessed the existence of any major waste management plan in the municipality. Also, there is weak enforcement of the existing waste management laws. This has made people dump waste indiscriminately since people are not being punished for such behavior to serve as scapegoats”. (Zoomlion Staff, May 2014)

In confirmation, another Zoomlion worker lamented that:

“The challenge we face here is that people ignore waste not generated by their household or not closer to their homes looking up to the assembly or our outfit to come and collect the waste.

This is contributing to the solid waste management problem in the municipality". (Zoomlion Staff, May 2014).

Also, lack of capacity building and institutional capacities, with a mean of (2.1579), lack of coordination and proper management (2.3684) and lack of planning activities, including implementation of the strategic waste management plan (2.2105), were some of the human and natural causes of the problems of the municipal solid waste management in the WA Municipality, even though they are not severe causal factors. A Zoomlion staff during the field survey revealed that:

“Waste management needs a collaborative approach. It involves all relevant stakeholders from the community, assembly, we the private sector and government to coordinate our activities to achieve proper waste management. One other challenge is that the human resource expertise is low and the waste management institutions are weak and the opportunities for capacity building are non-existent. It’s been a major challenge”. (Zoomlion staff, May 2014).

Again, causal factors such as lack of resources in the municipalities to provide consulting, information, training, and networking services for the implementation of regulations, with a mean of (1.8947), and limited or inadequate budget for solid waste management programs were issues considered as the least causes of the aforementioned problem. Majority of the respondents, constituting about 60% attributed the causes of waste management problems to lack of funds to purchase more containers for the municipality. Some respondents (40%) saw high cost of the containers and equipment constraints as the causal factors for waste management problems in the municipality as claimed by an assembly staff:



“The assembly faces financial challenges and other responsibilities hence it is unable to provide the much-needed refuse containers in the municipality. We are aware of the challenge and we will try and rectify them”. (Assembly staff, May 2014)

The study affirms and highlights the findings of Tsiboe and Marbell (2004) suggesting that a combination of poverty, population pressure, and economic hardships are placing a considerable strain on household environments. Municipal authorities have not been able to keep pace with the rapid accumulation of waste. This has resulted in waste being found in gutters, drains, and in water bodies. Some of the municipality’s final garbage disposal sites are also located near the river bodies and are polluting the environment. These practices have also created an unhealthy environment in the region.

Barriers to successful solid waste management in the municipality involve several factors. About 46.7% of respondents confirmed that high cost of waste collection was the main barrier to successful and fairly solid waste management in the municipality.

Others constituting about 29% mentioned factors such as ignorance/illiteracy on waste management on the part of residents and the remaining 24.3% of the respondents argue that the lack of sanitary equipment, are the barriers to a successful and fairly solid waste management in the municipality. One respondent from the Municipal Zoomlion office argues that:

“The impediment to our successful waste management in this municipality mostly comes from ignorance of the people on the relevance of effective waste management. As a result, they see our services as costly or expensive so they seek for other appalling alternatives”. (Zoomlion Worker, May 2014).



Subsequently, the Assembly Staff who responded to the study viewed high cost of waste collection as the main barrier to successful solid waste management in the municipality. Some Assembly Members saw the lack of commitment, lack of sanitary equipment and ignorance of some residents on waste management as the main barriers to successful solid waste management in the municipality. An assembly staff posited that:

“Waste management involves a lot of cost to the assembly so fees charged, though moderate, from our viewpoint, is seen as high by the residents. They want us to even make it free. When previously nothing was charged people still dumped waste indiscriminately so it is not only the cost that is the problem but ignorance and bad attitudes of some people”. (Assembly Staff, May 2014)

The findings suggest that high cost of waste collection was the main barrier to successful solid waste management in the municipality hence affirming Tsiboe and Marbell (2004) assertion that majority of Ghanaians live below the internationally recognized poverty line of one dollar a day. People see waste collection services as expensive and in view of this; one can imagine the pressure that is put on the city's infrastructure in the course of the day to day activities. Some say the problem of waste disposal is cultural, others say it is economic, yet others point in the direction of poor management. Public-Private Partnership is seen as an efficient model for the effective waste management in towns and cities. However, certain obstacles derail these partnership models as a Zoomlion staff puts it:

“We all agree that government engaging the private sector in waste management has paid a lot of dividends. People have appreciated the efficiency in waste management since our partnership with government. But the major challenge to the sustenance of the partnership with



government is the delay on government's part in redeeming its financial commitment to our outfit". (Zoomlion Worker, May 2014).

Another Zoomlion staff lamented on inadequate supervision from both their outfit and from the government on waste management by concluding that:

"I must admit we all fall foul in terms of effective supervision of waste management services. We are doing our best but I believe my outfit and government or the assembly must do more". (Zoomlion Staff, May 2014)

The assemblymen, who responded to the study, unanimously ascribed the delay in payments as the major constraints to the sustenance of PPP. Also, corruption was seen by some Assemblymen as an obstacle to PPP. These agree in principle the views of Kendie (1999) and Satterthwaite (1998) that the waste problem emanates from poverty and lack of funding as a result of low level of economic growth.

4.6 Effectiveness of PPP arrangement in Solid Waste Management in the Wa Municipality

Effectiveness of PPP arrangement in solid waste management in the Wa Municipal Assembly sought to find out how the participation or otherwise of the Zoomlion company could affect the way and manner in which waste especially solid waste is managed within the municipality.

4.6.1 Measures for Effective Collaboration and Sustainable PPP in Waste Management in the Wa Municipality

Most respondents from Zoomlion posited that timely payment to stimulate in high and effective performance from private contractors is the primary sustainability measure for PPP. Other Zoomlion workers viewed constant supervision of private contractors as the measure for effective collaboration and sustainable PPP in Waste Management.



On the other hand, the assembly men who responded to the study said constant supervision and clearly defined contracts were the main measures to put in place to ensure that private contractors do their waste management jobs properly. Other Assembly members suggested timely payment of contractors as a measure to ensure that private contractors do their jobs properly in ensure sustainability in waste management as claimed by one assembly staff:

Constant supervision is good in ensuring the effectiveness of waste management in the municipality and the region at large. The assembly constantly supervises activities of Zoomlion on waste management
(Assembly Staff, May 2014).

The study reveals that monitoring an activity aids in the enhancement or ensuring the effectiveness of solid waste management in the Municipality. Zoomlion workers had divergent views, whilst some stated that contracts between the local government and the private companies provide best practices for sustainable solid waste disposal and management, a few other had inverse views that contracts between the local government and private service providers promote bribery and corruption. Disturbingly, a majority of the respondents (53.3%) viewed Wa Municipal Assembly as incapable enough to monitor the activities of private contractors (Zoomlion) as a staff of Zoomlion in the Municipality claimed that:

“We know corruption and bureaucracy are bedeviling our public sector. Our partnership with the assembly has ensured transparency and reduced corruption in waste management in the municipality”.
(Zoomlion Staff, May 2014).



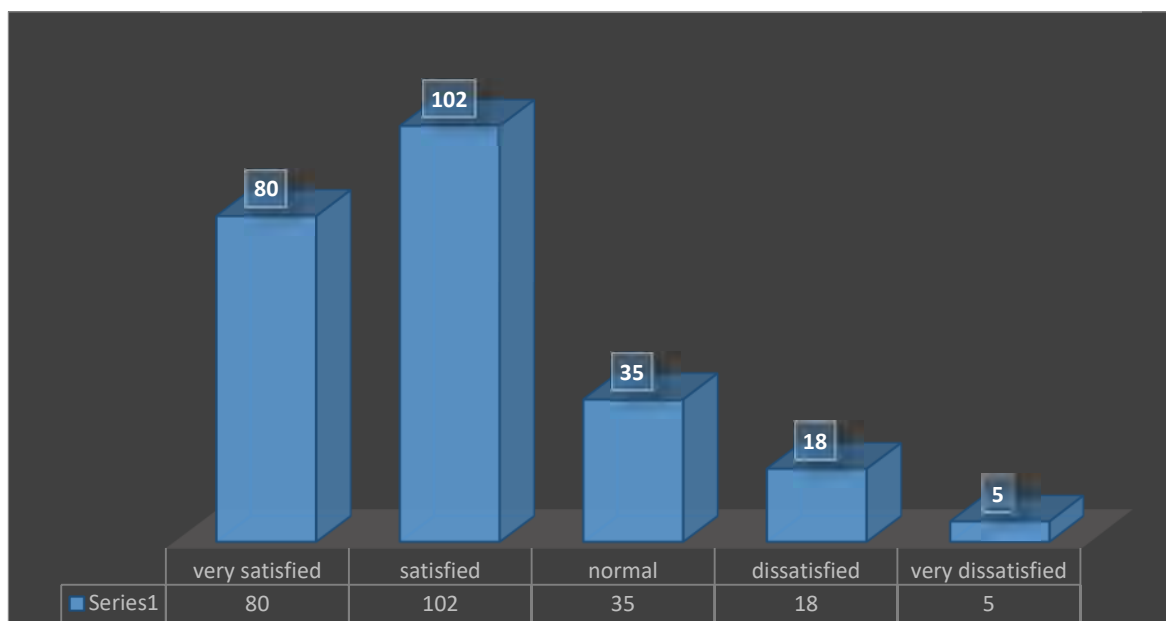
Another staff also impugned the capability of Wa Municipal Assembly on monitoring the activities of private contract contractors (Zoomlion) by saying:

“The Municipal Assembly is full of bureaucracy so how can they effectively monitor the activities of private contractors. I doubt their capacity to do that”. (Zoomlion Worker, May 2014).

Assembly Staff interviewed unanimously on the other hand, in their contribution said that local government contract with private services providers reduces corruption. Conversely, other 40% of the respondents said monitoring promoted bribery and corruption. All assemblymen unanimously attested to the fact that the WaMunicipal Assembly has the capacity and are capable enough to monitor the activities of private contractors (Zoomlion).

4.6.2 Level of citizens Satisfaction

Figure 4.6: Level of satisfaction of Citizen and users of the Zoomlion Service under PPP



Source: Field Data, 2014



This figure sought to analyse from the respondents their level of respondents. These respondents included only the household and beneficiaries minus the official who are supposed to be the service designers.

Only 23 out of the 240 persons said they were either dissatisfied or very dissatisfied with the PPP arrangement constituting less than 10% (9.58%). About 14.58% of data respondents have no particular form of feeling towards the arrangement. However, 75.83% of respondents within the Wa Municipal Assembly were either satisfied with the service or were very satisfied. This is displayed in figure 4.6 above

4.6.3 PPPs and Solid Waste Management in the Wa Municipality

In Ghana, like most African countries, local government authorities have traditionally been responsible for public services, including solid waste management services. However, due to governments' inability to provide adequate and efficient waste management services, private sector involvement in urban solid waste management was initiated in the early 1990s to reduce the financial burden on local governments, improve access to solid waste services and ensure efficient and quality waste management service delivery. The move towards private sector involvement in waste management in the country was largely influenced by the World Bank sponsored Urban Environmental Sanitation Project (World Bank, 1996) and this has grown to receive backing from the National Environmental Sanitation Policy (1999) which was revised in September 2010. Currently, contracting out to the private sector has become the predominant approach for delivering waste management services in many cities in Ghana with the private sector collecting over 80% of the waste generated in many cities in Ghana.



Government and the private sector engaging in public-private partnerships are influenced by certain factors. Table 4.3 presents the views of households on the reasons for privatizing waste management services in the Wa Municipality. From household members, political power, with a mean of (3.0526), and privatization initiative (2.8421) were the main or primary drivers behind the attraction towards privatization of some waste management services in the Wa Municipality. Also, lack of expertise/institutional capacities, with a mean of (2.2632), and cost of collection/disposal (2.210) were seen by household members as secondary stimulating factors for privatization of waste management services in the municipality. Again, lack of technical personnel/equipment in the public sector, with a mean of 2.1053, and cost of building a solid waste management facility, such as a sanitary landfill (2.1053), were tertiary drivers behind the attraction towards privatization of some waste management services in the Wa Municipality. Table 4.9 indicates the drivers of PPP and solid waste management in the Wa Municipality.

Table 4.8: Drivers of PPP in Solid Waste Management Services in the Wa Municipality



Variables	Mean	Std. Deviation
Cost of building a solid waste management facility such as a sanitary landfill	2.1053	.91361
Cost of collection and disposal	2.2105	1.19819
Lack of technical personnel and equipment in the public sector	2.1053	.91361
Lack of expertise and institutional capacities	2.2632	1.25268
Privatization initiative	2.8421	1.18418
Need for political power	3.0526	1.31974
Valid N (list wise)		

Source: Field Survey, 2014.

As revealed by Table 4.8, most of the respondents view the efficiency of waste management as the primary or main driver behind the attraction towards privatization of solid waste management services in the WA Municipality. Political strategy was also seen as another reason behind the attraction towards privatization of some of the services in the WA Municipality as the operations manager of Zoomlion Ghana limited in the Wa Municipality asserted:

“For us private firms, we have efficient delivery of solid waste management services as our hallmark and this, we believe, serve as the catalyst for our involvement by the municipality to compliment their effort in waste management (Zoomlion staff, May 2014)

In affirmation of the view of the Zoomlion Ghana limited Staff, an Assembly staff of Wa municipality said:

“The private companies, because they work for profit, don’t waste time on their activities. They are very efficient, that is the reason why in one of our meetings, most of us agreed and applauded the services of Zoomlion Ghana Limited in their management of waste in the Municipality”. (Assembly staff, May 2014)

The study found about 60% of the respondents, mentioned efficiency as the motivation for the attraction towards privatization of some solid waste management services. The remaining 40% of the total number of respondents saw pre-financing as the stimulant for engaging the private sector in waste management in the municipality. This observation was made known by another Assembly staff supports that:



“Government and the Assembly have a lot of problems to solve and all this require capital. So, sometimes, waste management funds become unavailable and that influenced us to partner with Zoomlion since, as a private firm, they will have money available to pre-finance their services so that we redeem our commitment later”. (Assembly staff, May 2014).

Subsequently, respondents stated that the involvement of private sector in solid waste management has become so attractive. About 80% of the respondents attributed the attractiveness of private sector in solid waste management to readily and timely availability of their services. About 20% attributed private sector attractiveness in solid waste management to pressure on the Assembly in solid waste management as a staff of Zoomlion Ghana Limited puts it:

Our company always wants to set a benchmark in the waste management services; hence we do our work assiduously and with alacrity. We have the people we serve at heart so we provide them the efficient and best of services at our disposal. (Zoomlion staff, May 2014)

In a nutshell, the attractiveness of private sector involvement in solid waste management is ascribed to the ready availability of the services of Zoomlion Ghana Limited in waste management. The timely service delivery is seen as a contributory factor for private sector attractiveness.



4.7 Institutional mandates and Policy Framework for Wa Municipality under PPP

Public–Private Partnerships, also known as P3 or PPPs, are contracts between government agencies and private businesses that involve the government agency paying, reimbursing or transferring a public asset to the private sector in return for goods or services over a set time period. Public –Private Partnerships do not occur in a vacuum but rather in the context of agreements. An agreement will naturally be in the form of a contract that spells out the expected conduct and/or obligations of each partner (Kroukamp 2004; Grimsey& Lewis 2004). To a large extent, the agreement should define the nature of the partnership and the commitments of each role player. In this regard, it would be expected that the agreement would glue together various elements of the partnership into a dynamic whole. In addition, as part of the agreement, the ground rules should be spelled out to ensure optimal cooperation.

By the creation of the District Assemblies, one of the major tasks given to them was to manage the waste generated within their area of jurisdiction. In exercising the power conferred upon them by Section 79 of the Local Government Act of 1993, the

Metropolitan Assemblies are to create Waste Management Departments (WMDs) and to enact by-laws to enable the WMD to perform their waste management functions. In addition, the Environmental Sanitation Policy (1999) published by the Ministry of Local Government and Rural Development (MLGRD) states that:

The District Assemblies [including Metropolitan and Municipal Assemblies] are to be responsible for managing and protecting the environment so as to prevent hazards to human health, conserve natural resources and maintain pleasant surroundings. Districts are to achieve this through public education, provision of environmental sanitation services and the application and enforcement of environmental regulations.



In accordance with the policy framework, immediate responsibility for solid-waste management (collection, transportation, disposal and/or treatment) in the Wa Municipal Area lies with the Municipal Assembly (WMA). It is the Assembly's responsibility to ensure that adequate waste management resources are made available within its area of jurisdiction. To accept and further show its commitments to this course, it's again spelled out clearly that:

All wastes deposited in the public domain shall be the property of the Assembly. Hence, the Assembly and/or its registered agents or contractors shall be exclusively responsible for the management of both solid and liquid wastes within the entire administrative area of the Assembly. And that every household, industry, office and other premises within the municipality shall make its solid wastes available to the Assembly or its authorized agents or contractors for disposal or otherwise (*WMA Bye-law 2006*).

The above provision clearly indicates that waste management resources would either be maintained and operated by the Assembly itself (through its Waste Management Department and the Environmental Health and Sanitation Department which is responsible for the enforcement of regulations regarding sanitation) or under concession or contract arrangement with private sector organizations. In either case, it is the Assembly's responsibility to issue licenses to all environmental sanitation service providers, renewable periodically and subject to satisfactory performance.

In order to realize these policies and aspirations, there are other institutions and agencies with which works cooperatively with WMA. This is in view of the fact that effective solid waste management depends upon an appropriate distribution of functions, responsibilities, authority, and revenues for national, provincial and local governments, as well as intra-urban entities such as communities (Schubeler, 1996).



All occupiers or owners of premises with the exception of household premises shall designate a member of their staff to be directly responsible for all matters relating to waste management and such designated staff shall liaise with the Assembly or its authorized agents or contractors on all waste approved by the Assembly. WMA is, therefore, the pivot around which all the coordination and partnerships needed for effective waste management revolves, it serves as the policy making body as well as the financier of the waste management services in the metropolis. Thus, all decisions concerning waste management, whether taken directly by WMA itself or other agencies, must be approved by Wa municipal assembly. The Assembly also fixes all user fees to be charged and collected by the private contractors. The private company is accountable to the Assembly because it is the Assembly's responsibility to monitor and evaluate their (private contractors) operations to determine whether their contracts agreement is duly

4.7.1 Institutional Responsibilities for Waste Management Service Delivery

Service contracts do not occur in a vacuum but rather in the context of agreements. An agreement will naturally be in the form of a contract that spells out the expected conduct and/or obligations of each partner (Kroukamp 2004; Grimsey & Lewis 2004). To a large extent, the agreement should define the nature of the partnership and the commitments of each role player.

Waste management practices in Ghana are guided by the Environmental Sanitation Policy of 1999 which was revised in the year 2010. This document spells out the roles of the various stakeholders including the private sector as well as the Growth and Poverty Reduction Strategy (GPRS II) which prescribes public-private partnership in solid waste management and other legislative documents. To ensure efficient and effective service delivery, solid waste service providers have been engaged in all the cities to collect and transport waste to final disposal sites.

Principally, there are two solid waste collection systems in Ghana - door to door collection system which takes place in the low-density areas of the urban center's, and communal collection system in the high-density areas. There is some amount of pre-collection in areas of poor accessibility based on the use of Manual and Motorized Tricycles introduced by Zoomlion. Waste disposal in Ghana is mainly by land filling. (Agyepong, 2011)

The Ministry of Local Government and Rural Development (MLGR&D) is responsible for policy. District Assemblies are the key institutions responsible for waste management service provision at the local and community level. The Ministries also take care of the national level, providing policy and technical guidelines in order to ensure sustainable financing which serves as a catalyst to improving service delivery. Solid waste collection user fee schemes have been introduced by a number of municipalities to mobilize revenue from service beneficiaries to support the financing of waste collection by the private sector.

4.8 Conclusion

This chapter examines the brief history of the assembly and analysis the demographic characteristics of the respondents. In all seventeen (17) officials and two hundred and forty (240) citizens and individuals within the municipal assembly, of the Upper West Region were purposively interviewed face to face or were randomly selected for a questionnaire. The benefits of adopting PPP in solid waste management was analysed as well the challenges confronting the conglomeration of the two. It was discovered that public policy, finance and the participation of all stakeholders including citizens and institution is an important ingredient in achieving success. Principally, the not so involved I don't care attitudes of most citizens and resident is one critical issue to the solid waste management practice in the municipality leading to the outbreak of cholera,



malaria, and loss of fertility of the soil which affects the livelihood of the people directly and indirectly.



CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter five is the final chapter of this research work. It is presented in major thematic areas. It focused on the various findings of the research work as set out in the research objectives, and the necessary recommendations that is application to areas that have similar characteristics with the area of study. It also has a general conclusion on the entire research work.

5.2 Summary of Major Findings

The summary of the major findings is arranged under key sub headings. This is to allow for easy presentation and clarity of presentation. It is presented under Sources and Types of Solid Waste Management Generated in the Wa Municipality, Benefits of Public-Private Benefits in Waste Management, Barriers to Private Sector Participation in Solid Waste management and the effectiveness of PPPs in solid waste management especially using the Zoomlion Ghana Ltd and the Wa Municipal Assembly of the Upper West Region Example.

5.2.1 Sources and Types of Solid Waste Management Generated in the Wa Municipality

Solid waste management has been an issue in urban areas since modern societies and households generate more solid waste than early human settlers ever did. Daily lives in these urban settlements generate several pounds of solid waste per consumer, not only directly in the home, but indirectly in factories that manufactured goods purchased by consumers.



The types of waste or garbage generated from urban households include organic waste (kitchen waste, vegetable waste etc.), toxic waste (old medicines, chemicals, bulbs, spray cans, fertilizer and pesticide containers, batteries etc.), recyclable waste (paper, glass, metals, plastics etc.). These waste generated by the majority of households include residential, industrial, commercial, institutional, construction, demolition, and agricultural waste.

5.2.2 Benefits of Public-Private Benefits in Waste Management

The effective Public-Private partnership ensures efficient use of resources. Pre-financing and private sector participation and motivation are usually the benefits of public-private partnership. Furthermore, PPP provides a holistic approach to solid waste management and also a provider of private sector participation in waste management. PPP reduces government burden and also provides an open and transparent way of waste management in the WA Municipality.

Private participation in solid waste collection has benefited consumers in terms of wider coverage and service reliability but has also increased environmental dangers and worsened labour conditions. This study found that the role of Zoomlion in delivering solid waste management services as very satisfactory.

In evaluating the company's activities, with regards to the PPP, that quality assessment of waste management services is very relevant in view of the health consequences associated with poor quality waste management services. Thus, the general public and customers of waste management firms are more concerned about the quality of services delivered.



The efficiency of the operations of public and private entities in solid waste collection in developing countries is more effective than the public sector alone. The respondents pointed out that clients of both public and private actors perceive the problem of solid waste to be very serious. The findings from these studies imply that waste management still continues to be a major concern for many people, even with the participation of the private sector.

Solid waste management has become a major challenge in many cities where hitherto waste management had been the sole responsibility of central government. The problems of solid waste in these countries have been worsened with rapid urbanization and growing numbers of slums resulting in major problems relating to public health, environmental pollution, and aesthetic nuisance.

The public sector is constrained due to lack of managerial and technical capacity, cumbersome procurement procedures, and inadequate financial resources. These constraints have resulted in an increased interest in PPPs in urban solid waste management in many developing countries in recent years with the main objective of improving efficiency in waste collection, reducing costs and reforming the weak performance of the public sector.



5.2.3 Challenges or Barriers to Private Sector Participation in Solid Waste Management

The management and treatment of solid waste in the Wa Municipality is not a priority of local government; hence it is not given proper budgetary support and staff, and waste management workers are seldom protected from direct contact and injury and are exposed to waste which are co-disposed with municipal wastes. Zoomlion as the foremost waste management company in Ghana is a private waste management institution lack skilled technical waste personnel and low recovery rate and waste diversion from landfills because of low implementation of segregation at source, recycling and composting was discovered as some of the problems but not severe.

5.2.3.1 Challenges with PPP arrangements and operations

The least problems the municipality faces are unrestrained gas emissions from decomposition of organic wastes in open dumps/open communal containers and untreated wastes polluting surrounding soil and water bodies, lack of appropriate disposal sites because of costs, social acceptability and waste generation rates and indiscriminate dumping of wastes in rivers and bodies of water, which contaminates surface and ground water supplies in the municipality.

Again, the lack of capacity building and institutional capacities, lack of coordination and proper management and lack of planning activities, including implementation of the strategic waste management plan, are some of the human and natural causes of the problems of the municipal solid waste management in the Wa Municipality.

Sometimes, there is clarity of roles and responsibility. Because it's a PPP arrangements, for the Zoomlion Company to fulfill their responsibility, the state in the person of the



Wa Municipal Assembly must first honour its obligation. And so if this is not done, it becomes a more of

However, the biggest challenges to the PPP arrangement is financing. There are various pressing needs on the assembly items list and so waste collection is often not one of the first even though is one of the biggest social menace to the assembly.

5.2.3.2 Challenges with waste collection in the Wa Municipality

The study finds that all kinds of wastes, regardless of their nature, are being dumped indiscriminately into water bodies, depressions, sand pits, old quarries, drains and even in certain areas, along streets. The current solid waste management problem emanated from the poor attitude of the residents, inadequate dumping site, inadequate communal containers and untimely disposal of waste were ascribed to as contributory factors to the municipality's current solid waste management problems.

More so, the creation, monitoring, and enforcement of waste management ordinance and not-in-my backyard syndrome were the major human and natural causes of the problems of the municipal solid waste management in the Wa Municipality.

Moreover, the high cost of waste collection, ignorance/literacy and lack of sanitary equipment's are the main barriers to successful and fairly solid waste management in the municipality. The study also ascribed the delay in payments as the major constraints to the sustenance of PPP. Also, corruption is seen as an obstacle to PPP.



5.2.4 Measures for Effective Collaboration and Sustainable PPP in Waste Management

The study reveals that the timely payment to stimulate in high and effective performance from private contractors, clearly defined contracts, constant supervision and timely payment of contractors for waste management jobs done are the primary sustainability measures for effective collaboration and sustainable Public Private Partnership in waste management in the Municipality.

The study reveals that monitoring an activity aids in the enhancement towards ensuring the effectiveness of solid waste management in the Municipality. Contracts between the local government and the private companies provide best practices for sustainable solid waste disposal and management, few others had inverse views that contracts between the local government and private service providers promote bribery and corruption.

Whiles many researchers in the area have found that institutional support and the availability of resource is a critical factor for an effective solid waste management (DHRC, 2012; Mariwah, 2012; Sikes, 1991) which is collaborated by this research. This research has also discovered amongst many other that the willingness and attitudinal change of the local people to embrace the policy and work with it is the single most important ingredient. To the extent that, with or without a PPP arrangement, as long as the local actors are committed, solid waste management is less costly and even more efficient.

5.4 Recommendations

Experiences gained from the field survey and review literature makes it possible for recommendation to be made on how PPP can work in SWM in the Wa Municipality.



In SWM, every actor's role is very important. However, households are the main actors who produce more waste day by day.

5.4.1 Central Government and Municipal Departments

- Any efforts towards the improvement of sustainable waste management and Public-Private partnership should be holistic, incorporating all the basic components such as infrastructure provision, and improving efficient monitoring and evaluation of waste management companies
- The sanitation Unit of the Municipal Assembly should organise and re-enforce its rules on waste disposal by increasing waste disposal containers/bins in all section of the Municipality for easy access by households.
- Wa Municipal Assembly (WMA) and the sanitation unit of the Assembly should formulate and issue laws on effective waste disposal to make sure that waste generated is properly disposed off in the designated places.

5.4.2 Private Sector Companies and NGOs

There should be an institutional support from the Municipal Assembly. This type of support should come in a package where Private waste management companies should be supported with tools and peaceful working environment devoid of problems so they can work effectively to promote proper and healthy waste disposal and treatment and management in the Municipality.



5.4.3 Citizens and other stakeholders

In terms of the inadequate funding and over dependence on the central Government to improve the sanitary conditions and waste management systems, the Wa Municipal Assembly (WMA) in partnership with private waste management companies (Zoomlion).

- Community leaders should be supported by the Municipal Assembly to form strong neighbourhood volunteer groups to undertake sensitization on cleanliness programs to educate the inhabitants towards proper disposal of waste in the settlements.
- There should be an intensive public education not only at the community places or public parks but more importantly at schools to instil the habit of hygiene and responsibility into the young ones
- Finally, the study on waste management and public-private partnership in has provided a bearing for additional research because it has highlighted a topic of emerging concern among local governments and civil society organizations.



5.3 Conclusion

In a nut shell, the methods employed in the study facilitated a thorough assessment of the research questions hence data collected, analyzed and presented were more informative. The study reveals that solid waste is a major problem of the WA Municipality.

On the sources and types of solid waste or garbage generated from urban households of the municipality include: organic waste (kitchen waste, vegetable waste etc.), toxic waste (old medicines, chemicals, bulbs, spray cans, fertilizer and pesticide containers, batteries etc.), recyclable waste (paper, glass, metals, plastics etc.).

On the barriers of private sector participation in solid waste management, the study reveals that the least problems the municipality face are uncontrolled gas emissions from decomposition of organic waste in open dumps and untreated waste polluting surrounding soil and water bodies, lack of appropriate disposal sites because of costs, social acceptability and waste generation rates.

Besides, some theoretical background of public private partnership with reflections on solid waste management was discussed in this chapter. These theories include Sociological theories, Economic theories, and Management theories. Sadly, most of the PPP and SWM sustainable management approaches and frameworks failed to realize that the economic, socio-cultural, political and institutional variations among developing countries make it impossible to adopt an identical strategy.

The public sector is constrained owing to lack of managerial and technical capacity, cumbersome procurement procedures, and inadequate financial resources. These constraints have resulted in an increased interest in PPPs in urban solid waste management in many developing countries in recent years with the main objective of improving efficiency in waste collection, reducing costs and reforming the weak performance of the public sector.



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Figure A: Pictures from Kambali Refuse collection points in Wa



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Source: Field Data 2014





Source: Field Data 2014



APPENDIX I

HOUSEHOLD QUESTIONNAIRES

This questionnaire is to elicit information to assess Wa municipal assembly partnership with Zoomlion Ghana in Solid Waste Management in the Wa municipality. The focus is to investigate public private partnership in SWM in growing towns of Ghana as an effective option for solid waste management. Your participation is voluntary and the information obtained from you will always remain confidential and anonymous. No information obtained would be shared with any third party. Your answers to these questions are for the purpose of this research only. Thank you.

Please Tick (✓) as appropriate

SECTION: DEMOGRAPHIC INFORMATION

1. Which of the age groups do you belong?

- a. 12-20 [] b. 21-30 [] c. 31- 40 [] d. 41-50 [] e. 60
+ []

2. What is your highest educational attainment?

- a. Basic (Primary & JHS) [] b. SHS [] c. Graduate [] d. Post

Graduate []

e. Other Specify:

3. What is your marital status? a. Married [] b. Single [] c. Divorced []

4. What is your gender? a. Male [] b. Female []

5. How many people live in this household? Enter number

6. How long have you been living in this Municipality?

- a. 1-2 years [] b. 3-4 years [] c. 5-6 years [] d. 6 years
and above



7. How do you dispose off your household waste?

8. Are you aware of any agreement/ collaboration between Zoomlion and the municipal assembly towards waste management?

a. YES

b. NO

9. How much roughly is your monthly disposal income?

A. less than GHC100

B. between GHC100-500

C. between GHC500-1000

D above GHC1000

SECTION B: ASSESSING SOLID WASTE SITUATION IN WA: WITH REFERENCE TO THE ASSEMBLY AND THE ZOOMLION PARTNERSHIP FROM HOUSEHOLD PERSPECTIVE.

PART (I)

9. What are the methods employed to dispose off household waste before the introduction of Zoomlion products and operations?

.....

.....

What are the current problems with municipal solid waste management in your

city? The current problems of municipal solid waste management in the municipality

are: Please use the following 5 point Likert scale to indicate your agreement or

disagreement to the following where 1. Strongly Agree 2. Agree 3. Neutral

4.Disagree 5. Strongly Disagree





<p>9. Uncontrolled gas emissions from decomposition of organic wastes in open dumps and untreated pollutes surrounding soil and water bodies</p>	<p>(1) (2) (3) (4) (5)</p>
<p>10. Indiscriminate dumping of wastes in rivers and bodies of water which contaminates surface and ground water supplies.</p>	<p>(1) (2) (3) (4) (5)</p>
<p>11. Low recovery rate and waste diversion from landfills because of low implementation of segregation at source, recycling and composting.</p>	<p>(1) (2) (3) (4) (5)</p>
<p>12. Waste workers are seldom protected from direct contact and injury and are exposed to hazardous and medical wastes which are co-disposed with municipal wastes.</p>	<p>(1) (2) (3) (4) (5)</p>
<p>13. Low recovery rate and waste diversion from landfills because of low implementation of segregation at source, recycling and composting.</p>	<p>(1) (2) (3) (4) (5)</p>

14. Lack of appropriate disposal sites because of costs, social acceptability and waste generation rates.	(1) (2) (3) (4) (5)
15. Lack or absence of skilled technical waste personnel in an local governments	(1) (2) (3) (4) (5)
16. Solid waste is not a priority of local government, hence, not given proper budget and staff	(1) (2) (3) (4) (5)
17. OTHER SPECIFY.....	

PART B: THE NATURAL AND HUMAN CAUSES OF THESE PROBLEMS

Please use the following 5 point likert scale to indicate your agreement or disagreement to the following where 1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree



18. Lack of sustainability of the solid waste management program	(1) (2) (3) (4) (5)
19. Vague and fragmented organizational structure is also a source of problem	(1) (2) (3) (4) (5)
20. Lack of planning activities including implementation of the strategic waste management plan	(1) (2) (3) (4) (5)
21. the local government lack comprehensive plans	(1) (2) (3) (4) (5)



22. Lack of coordination and proper management	(1) (2) (3) (4) (5)
23. Creation, monitoring and enforcement of waste management ordinance	(1) (2) (3) (4) (5)
24. Not-in-my Backyard Syndrome - This NIMBY syndrome is a major barrier to the sitting of waste disposal	(1) (2) (3) (4) (5)
25. Limited or inadequate budget for solid waste management programs is one of the major issues	(1) (2) (3) (4) (5)
26. There is also lack of capacity building and institutional capacities	(1) (2) (3) (4) (5)
27. Lack of resources in the municipalities to provide consulting, information, trainings and networking services for the implementation of regulations.	(1) (2) (3) (4) (5)
28. OTHER SPECIFY	

PART C: What are the main drivers behind the attraction towards privatization of some of solid waste services in the WA Municipality?

Please use the following 5 point likert scale to indicate your agreement or disagreement to the following where 1. Strongly Agree 2. Agree 3. Neutral 4. Disagree 5. Strongly Disagree

29. Cost of building an solid waste management facility such as a sanitary landfill	(1)	(2)	(3)	(4)	(5)
30. Cost of collection and disposal	(1)	(2)	(3)	(4)	(5)
31. Lack of technical personnel and equipment in the public sector	(1)	(2)	(3)	(4)	(5)
31. Lack of expertise and institutional capacities	(1)	(2)	(3)	(4)	(5)
33. Privatization initiative	(1)	(2)	(3)	(4)	(5)
34. Done for political power	(1)	(2)	(3)	(4)	(5)
35. Other specify.....					

PART D: SUSTAINABILITY CONCERNS

36. Do you think the public private partnership model is a suitable model for the people of Wa

municipality?.....



37. What are the benefits and constraints of Public Private Partnership?

.....

38. How do you see the role of Wa Municipal in creating PPP models?

.....

39. How do you evaluate the role of private sector in delivering solid waste services?

.....

APPENDIX II

QUESTIONNAIRES FOR THE ASSEMBLY

This questionnaire is to elicit information to assess Wa municipal assembly partnership with Zoomlion Ghana in Solid Waste Management in the Wa municipality. The focus is to investigate public private partnership in SWM in growing towns of Ghana as an effective option for solid waste management. Your participation is voluntary and the information obtained from you will always remain confidential and anonymous. No information obtained would be shared with any third party. Your answers to these questions are for the purpose of this research only. Thank you.

Please Tick (✓) as appropriate

SECTION: DEMOGRAPHIC INFORMATION

3. Which of the age groups do you belong?

- b. Below 20 [] b. 21-30 [] c. 31- 40 [] d. 41-50 [] e. 60
+[]

4. What is your highest educational attainment?

- a. Basic (Primary & JHS) [] b. SHS [] c. Graduate [] d. Post

Graduate []

e. Other Specify:

3. What is your gender? a. Male [] b. Female []

4. How long have you been working for the assembly?

- b. 1-2 years [] b. 3-4 years [] c. 5-6 years [] d. 6 years and
above []

5. How many people live in this household? Enter number

6. How long have you been living in this Municipality?



- c. 1-2 years [] b. 3-4 years [] c. 5-6 years [] d. 6 years
and above

7. How do you dispose off your household waste?

8. Are you aware of any agreement/ collaboration between Zoomlion and the municipal assembly towards waste management?

- c. YES
- d. NO

9. How much roughly is your monthly disposal income?

- A. less than GHC100
- B. between GHC100-500
- C. between GHC500-1000
- D above GHC1000

10. What is your designation?

- a. Planner
- b. Administrator
- c. Engineer
- d. Finance
- e. Other specify.....

Section B: Assessing Wa municipal assembly partnership with Zoomlion

11. What are the current problems with municipal solid waste management in the municipality?

.....

.....

12. What do you think are the cause of these problems?



.....
.....

13. What is your opinion about community or households participation in waste management issues and how can their participation help to improve the waste management efficiency?

.....

14. What are the main barriers to successful and fairly solid waste management in the municipality?

.....
.....

15. What is your opinion about Public Private Partnership (PPP) in solid waste management?

.....
.....



.....

16. Do you think involvement of private sector in solid waste services is useful?

.....
.....

17. How do you evaluate their activities and work efficiency with reference to Zoomlion Ghana?

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

18. Why involvement of private sector in solid waste management has become so attractive?

.....
.....

19. What are the main drivers behind the attraction towards privatization of some of solid waste services in your city?

.....

20. Do you think the public private partnership model is a suitable model in the municipality and are the people accepting it?

.....
.....

21. What are the benefits and constraints of Public Private Partnership?

.....
.....

22. How do you see the role of Municipalities in creating PPP models?



.....
.....

23. How do you evaluate the role of private sector in delivering solid waste services?

.....
.....

24. Do you think that the Wa municipality have the capacities and are capable enough to monitor the activities of private contractors (Zoomlion)?

.....
.....

25. What should be done in order to make sure that private contractors do their job properly and what should be the standard or evaluation criteria of their activities?

.....
.....

26. What is your opinion about corruption issues when municipalities or local government making contract with private service providers?

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

27. Are communities in favour of Public private partnership and has this model improved the solid waste services in any community that you know



APPENDIX III

QUESTIONNAIRES FOR ZOOMLION MANAGEMENT

This questionnaire is to elicit information to assess Wa municipal assembly partnership with Zoomlion Ghana in Solid Waste Management in the Wa municipality. The focus is to investigate public private partnership in SWM in growing towns of Ghana as an effective option for solid waste management. Your participation is voluntary and the information obtained from you will always remain confidential and anonymous. No information obtained would be shared with any third party. Your answers to these questions are for the purpose of this research only. Thank you.

Please Tick (✓) as appropriate

SECTION: DEMOGRAPHIC INFORMATION

5. Which of the age groups do you belong?

- c. Below 20 [] b. 21-30 [] c. 31- 40 [] d. 41-50 [] e. 60
+[]

6. What is your highest educational attainment?

- a. Basic (Primary & JHS) [] b. SHS [] c. Graduate [] d. Post

Graduate []

e. Other Specify:

3. What is your gender? a. Male [] b. Female []

4. How long have you been working for the Zoomlion Ghana?

- d. 1-2 years [] b. 3-4 years [] c. 5-6 years [] d. 6 years and
above []

7. Which of the age groups do you belong?



- d. 12-20 [] b. 21-30 [] c. 31- 40 [] d. 41-50 [] e. 60 + []

8. What is your highest educational attainment?

- a. Basic (Primary & JHS) [] b. SHS [] c. Graduate [] d. Post Graduate []

e. Other Specify:

3. What is your marital status? a. Married [] b. Single [] c. Divorced []

4. What is your gender? a. Male [] b. Female []

5. How many people live in this household? Enter number

6. How long have you been living in this Municipality?

- e. 1-2 years [] b. 3-4 years [] c. 5-6 years [] d. 6 years and above

7. How do you dispose off your household waste?

8. Are you aware of any agreement/ collaboration between Zoomlion and the municipal assembly towards waste management?

e. YES

f. NO

9. How much roughly is your monthly disposal income?

A. less than GHC100

B. between GHC100-500

C. between GHC500-1000

D above GHC1000



10. What is your employment status?

- a) Full time
- b) Part time

Section B: Assessing Zoomlion partnership with Wa municipal assembly

11. What are the current problems with municipal solid waste management in the municipality?

.....

12. What do you think are the cause of these problems?

.....

13. What is your opinion about community or households participation in waste management issues and how can their participation help to improve the waste management efficiency?

.....

.....

14. What are the main barriers to successful and fairly solid waste management in the municipality?

.....

.....

15. What is your opinion about Public Private Partnership (PPP) in solid waste management?

.....

.....

16. Do you think involvement of private sector in solid waste services is useful?

.....

.....



17. How do you evaluate their activities and work efficiency with reference to Wa municipality in Ghana?

.....
.....

18. Why involvement of private sector in solid waste management has become so attractive?

.....
.....

19. What are the main drivers behind the attraction towards privatization of some of solid waste services in the Wa municipality?

.....
.....

20. Do you think the public private partnership model is a suitable model in the municipality and are the people accepting it?

.....
.....



21. What are the benefits and constraints of Public Private Partnership?

.....
.....

22. How do you see the role of Zoomlion in creating PPP models?

.....

23. How do you evaluate the role of Zoomlion in delivering solid waste services?

.....

24. Do you think that the Wa municipality have the capacities and are capable enough to monitor the activities of private contractors (Zoomlion)?

.....
.....

25. What should be done in order to make sure that private contractors do their job properly and what should be the standard or evaluation criteria of their activities?

.....
.....

26. What is your opinion about corruption issues when municipalities or local government making contract with private service providers?

.....
.....

27. Are communities in favour of Public private partnership and has this model improved the solid waste services in any community that you know?

.....

