AN EVALUATION OF ZOOMLION GHANA'S PARTICIPATION IN SOLID WASTE MANAGEMENT IN ABLEKUMA CENTRAL SUB-METROPOLITAN AREA

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DECLARATION

I here declare that, this research An Evaluation of Zoomlion Ghana's Participation in Solid Waste Management in Ablekuma Central sub -Metropolitan Area is my own work and that the sources of secondary information used or cited have been acknowledged by means of complete references. This thesis has never been presented either in whole or part to any institution for the award of degree.

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DEDICATION

I wish to dedicate this work to my dearest wife Salome Yeboah for her patience, encouragement and unflinching support during this research.

To my dad and mum it is your prayers and words of encouragement that I have made it this far in education.

Finally, to all my brothers, it is my prayers that God almighty rewards you greatly for the moral support you gave me.

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ABSTRACT

Solid waste management (SWM) is becoming a major issue in most cities as a result of rapid urbanization and population growth. The provision of this public service had formally been the sole responsibility of central government. However, with theory of participation and decentralisation, the municipal authority has to seek new arrangements with the private sector. The purpose of the study was to evaluate Zoomlion Ghana's participation in solid waste management in Ablekuma Central sub-Metropolitan area.

Qualitative research was used. The research design used was evaluative case study.The target group for this study was made up of residents, officials of Ablekuma Central sub- Metropolitan area, officials and fieldworkers of Zoomlion Ghana. A total of 91 respondents were used for the study. This included some key informants of the Waste Management Department of Ablekuma Central sub- Metropolitan area; officers of Zoomlion Ghana. Two (2) officials were selected from the Waste Management Department of Ablekuma Central sub- Metropolitan area. Purposive and cluster sampling techniques were used in the sampling of the respondents. Multiple instruments were employed for the data collection in this research study: in-depth interview, interview scheduled and focus groups discussion.

The study revealed that the general waste situation in the Ablekuma Central sub- Metropolitan area has improved tremendously since the coming of Zoomlion Ghana into the area. For efficient and effective management of solid waste in Ablekuma Central sub-Metropolitan area, it was recommended that relevant information on clients' role should be made available, education of clients about the benefit of proper waste management, attention to client's complaints, enforcement of regulations on waste disposal and use of integrated solid waste management model.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Solid waste management is in crisis in many cities globally because of population growth and expansion. This has led to ever increasing quantities of domestic solid waste while space for disposal reduces. In urban areas, especially in the rapid urbanizing cities of the developing world, there is increase in volume and types of solid waste as a result of continuous economic growth, and industrialization. The growth of the towns and cities has resulted in increased population coupled with increased socio-economic activities, but there has not been enough in logistics for effective and efficient waste management services delivery. This problem has been acknowledged by most governments and municipal authorities. (World Bank Technical Guidance Report 1999; v)

The urban centers generate tremendous amount of garbage from households, schools medical facilities, and industrial areas (Boadi & Kuitunem, 2002).It is estimated that in 2006 the total amount of municipal solid waste generated globally reached 2.02 billion tones, representing a 7% annual increase since 2003 (Global Waste Management Market Report, 2007). It is further estimated that between 2007 and 2011, global generation of municipal waste will rise by 37.3%, equivalent to roughly 8% increase per year. If the trend should continue the same way then solid waste generation globally will be equivalent to 8% in 2012.

The main problems facing cities in developing countries with regard to waste management are related to the collection of waste from the city environments, with between one-third and one-half of all the waste generated in the cities remaining uncollected. Recent studies in Africa have shown that the problem of waste management has become intractable and threatens to undermine the efforts of most city authorities. Kirondi (1999:102) has observed

that the city environment in most developing countries is characterised by heaps of garbage, overflowing waste containers, chocked drains, clogged streams and stinking gutters. Hardoy *et al.* (1993:4) have therefore, aptly described the Third World urban environment as "among the most health and life threatening of all human environments".

According to UNICEF (1995), in sub –Saharan Africa, two-thirds of the people do not have access to improved sanitation and it has become necessary for national and local governments to ensure effective and sustainable management of waste. Recent events in major urban centres in Africa have shown that the problem of waste management has become a monster that has aborted most efforts by city authorities, states and federal governments and professionals' alike (Onibokun, 1999:2).

Urbanization is not a new phenomenon in Africa. However, the current rate of uncontrolled and unplanned urbanization in Africa has given rise to a huge amount of liquid and solid wastes being produced, so much so that these wastes have long outstripped the capacity of city authorities to collect and dispose of them safely and efficiently (Porter & Boakye-Yiadom Jr,1997; Chazan, 2002; Wetherall, 2003).

The increasing problems of waste disposal also bring to the fore questions related to governance, good government, and sometimes bad or poor governance in Africa. Swilling (1996:173) writes, "as levels of urbanization rise, the governance and management of urban development processes become increasingly important for the governance and management of a country as a whole" (Swilling cited in Gough 1999: 395).

In Ghana, waste management which is an assigned responsibility of the local authorities continues to be a challenge to city and rural dwellers. Various cities and managers of waste in

Ghana are overwhelmed with the volume of waste generated. In Accra, between 1,500-1,800 tonnes of waste are generated daily (AMA/WMD, 2005). Ghana's five largest cities (Accra, Kumasi, Sekondi-Takoradi, Tamale and Tema) accounts for about 19% of the total population and their residents generate an estimated 3,200 tonnes of solid waste per day (National Environmental Sanitation Strategy Action Plan, 2010). An average of 1200 tonnes of waste is collected daily. The uncollected wastes find its way into drainage systems and other open spaces as their final destination.

Some of the uncollected waste can also be found scattered inside communities, footpaths and along the streets. Management of solid waste is extremely poor and the recycling of sewerage and industrial wastes is practically non-existent. Inadequate disposal of solid wastes poses a risk to public health. The Projection of waste generation in Accra Metropolitan area for two (2) years (2003 – 2004) was as follows:

- 2003 – 1804 tonnes per day.
- 2004 – 1862 tonnes per day. (source :AMA/WMD, 2005)

Table one gives the waste generation and service coverage in the five large cities in Ghana. From Table one, none of the cities had the requisite capacity to collect the generated waste.

Table 1: Waste generation and service coverage in the five large cities in Ghana

City	Population	Daily waste generation (tonne)	Average daily collection coverage (tonne)	Average daily collection coverage (%)
Accra	3,500,000	1,800	1,200	67
Kumasi	1,300,000	1,000	700	70
Tema	500,000	250	200	80
Tamale	310,00s0	180	85	47
Sekondi/Takoradi	300,000	250	165	66

Source: AMA/WMD, 2005

According to Environmental Protection Agency (EPA) Ghana report (2003), the urban areas of Accra produce about 760,000 tons of municipal solid waste per year approximately 2000 metric tons per day (EPA). EPA report speculates by 2025, this figure is expected to increase to 1.8 million ton per year, or 4000 metric tons per day.

Waste management in Ghana has become a sophisticated issue that has been a major item on the priority list of successive governments, local authorities and international donors in recent years. Generally, existing public facilities including sanitary facilities are inadequate to serve the user population. Different problems are encountered at all levels of waste management namely, collection, transportation and disposal. In several cases waste collection vehicles, compactors and other heavy equipment required for effective waste management are too few and so existing resources have to be overburden to cover wider catchment areas than is desirable. Existing final disposal sites for municipal solid waste are not engineered and may be described as crude dumpsites. There is no waste separation at the sources of generation, and hazardous and clinical wastes are often handled together with municipal solid waste. The situation creates a suitable environment for breeding of disease vectors such as mosquitoes and cockroaches and the proliferation of rodents such as rats and mice.

Kendie(1999: 4) 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 people's minds and in the scheme of official development plans have not been adequately considered".

A study conducted by Porter & Boakye-Yiadom (1997:8), showed that most of the technologies employed to clean up the city of Accra was either too complicated or was too expensive for a developing country like Ghana. Also a study conducted by Benneh et al

(1993), showed that the problem of solid waste in Accra begins at the home. According to Benneh et al (1993: xi), open storage of solid waste was practiced by some 42% of households in Accra and some of the problems associated with this system of waste disposal have been the prevalence of rodents and flies around the homes. Most people however dump their garbage at designated sites in their neighborhoods. Benneh et al (1993: xi), puts the number of people who dump their refuse at official dumps at 70%.

It is obvious that existing waste management system where the government alone manages the waste cannot cope with the ever-increasing volume of solid waste being generated in Ghana. Therefore the public disposes off refuse indiscriminately especially in watercourses and drainage channels and often through burning. Huge piles of refuse and overflowing refuse containers are common in urban centres particularly near markets and squatter settlements.

Although considerable efforts are being made by many Governments in Ghana and other entities in tackling waste-related problems, there are still major gaps to be filled in this area. The World Bank in 2001 estimates that in developing countries, it is common for municipalities to spend 20-50 percent of their available budget on solid waste management (open dumping with open burning is the norm), even though 30-60 percent of all the urban solid wastes remain uncollected and less than 50 percent of the population is served. In low-income countries, collection alone drains up 80-90 percent of municipal solid waste management budget. In mid-income countries, collection costs 50-80 percent of total budget. In high-income countries, collection only accounts for less than 10 percent of the budget, which allows large funds to be allocated to waste treatment facilities. Upfront community participation in these advanced countries reduces the collection cost and facilitates waste

recycling and recovery. Hence, developing countries face uphill challenges to properly manage their waste with most efforts being made to reduce the final volumes and to generate sufficient funds for waste management.

Anjum and Deshazo (1996:41) report that in most cities, municipalities and towns in developing countries, solid waste management costs consume between 20% and 50% of municipal revenues. However, the waste collection service levels remain low with only between 50% and 70% of the residents receiving services and most of the disposal being unsafe. Bhatia and Gurnani (1996) have further observed that the efficiency of collection of waste in urban areas of developing countries vary from 59% to 82% suggesting that a substantial amount of solid waste remains uncollected. Poor solid waste collection and disposal is a threat to public health and reduces the quality of life for urban residents.

Several approaches have been suggested in order to improve solid waste management in developing countries. Chan (1998:317) observes environmental awareness campaigns through mass media and advertisements to be one of the methods that can be used to promote public awareness on solid waste management and other environmental issues. In another study, Anjum and Deshazo (1996:857) proposed an approach based on integrating demand-side information into the planning process and recommended the involvement of urban households in solid waste management planning. Many researchers: Kaseva and Gupta (1996:299), Seik (1997:427), Anjum and Deshazo (1996) and Kaseva et al (2002:299) have recommended an enhanced solid waste recycling as a sustainable approach towards solid waste management in developing countries. One of the solid waste management approaches adopted by most municipalities in developing countries is contracting out waste collection and disposal services to private solid waste collection and disposal contractors.

Similar approaches have also been reported in Calcutta, India (Bhatia & Gurnani, 1996) and Kumasi and Accra, Ghana (Post, 1999:201), where private operators are handling more than 40% of the waste. Private agencies engaged in waste management have higher operating efficiency because, firstly they are free from bureaucratic hurdles and the upkeep of their equipment is excellent. Good condition of vehicles and equipment ensures not only trouble-free operation but also results in higher output and profitability.

According to Boorsman (1994:17), private sector is endowed with qualities such as political independence, economic rationality, efficiency, dynamism and innovation; qualities which make it measure up favourably to public sector enterprise. The privatisation of solid waste collection also laid the basis for employment creation and income generation through waste collection, disposal and recycling and by that contributing to poverty reduction and urban environmental upkeep.

According to the Governments of Ghana (2003), the Accra Metropolitan Assembly spends about two billion cedis per month (about $227,000) on waste collection alone and about 12 billion cedis per year on urban solid waste management. This amount does however cater for about 30 per cent of the solid waste in the metropolis. Before 1995, 60 per cent of waste was collected by the waste management department. (Boadi & Kuitunem, 2002). After the government started privatization of solid waste collection in 1995, the ratio of waste collected by the public and the private sector increased up to 70 per cent by 1999. (Post, Broekema &Obiri-Opareh 2003:836)

Owing to the challenges faced by government in the management of solid wastes in the country, opportunity has been given to private companies to participate. There is an emerging

trend in encouraging the private sector to enter into solid waste management operations, and attempts are being made to formally link the public and private sector operators. Such linkages may improve the efficiency of the entire sector and create new opportunities for employment. This is because, current literature has thrown light on the fact that the administration and management of cities in Ghana has not been a monopoly of the formal institutions of government, but that forces outside the state have also played an important part in shaping the dynamics of urban governance (Gough, 1999; Halfani, 1997; Mohan, 1996).

This surge of new powerful forces at the local level within civil society combined with both national and international organizations like the International Monetary Fund(IMF) /World Bank, Canadian International Development Agency, Department For International Development, United Nations Development Programme support for privatization, decentralization and democratization, has led to new forms of local governance (Gough, 1999).During the 1980s as a result of IMF/World Bank led structural adjustment programmes which sought to privatize state own institutions, decentralize and stabilize balance of payment deficits with the ultimate aim of "freeing the market", the collection, transportation and disposal of solid waste in Accra changed to allow for greater participation of the private sector. As a consequence, the waste management department (WMD) was created in 1984 as a separate agency under the umbrella of the Accra Metropolitan Authority (AMA) to handle the collection and disposal of solid and liquid waste in the Accra Metropolis. (Tsiboe& Marbell 2003:10)

According to Post and Obirih- Opareh (2003: 50), the new system did not bring improvement in solid waste collection and sighted the following as likely causes: inadequate funding, poor cost-recovery and the introduction of the pay-as-you dump (PAYD) policy. Thus, in 1992, the WMD was further decentralized by creating a system whereby the other

six-metropolitan assemblies sometimes referred to as the "sub-metros" were given the day-to-day activities of collection, transportation and disposal of waste within their locality. Whilst this was created to offload some of the problems and work of the WMD, it actually made a bad situation worse as Post and Obirih-Opareh remarks:

> "The limited logistics available to the sub-metros made servicing extremely sensitive to vehicle breakdown as each area used its equipment solely for work within its own jurisdiction, whereas previously the WMD had used its fleet of vehicles and equipment as a pool which could be dispatched to the areas most in need. The WMD frequently had to organize extra runs at the weekend to collect piled-up waste. In fact, the decentralization exercise within AMA has helped to complicate further an already highly complex and confusing division of solid waste collection tasks and responsibilities" (Post and Obirih-Opareh, 2003: 50)

As a result of the failure of the WMD to resolve its solid waste disposal problems with the local authorities the government decided to privatize the collection waste. Taking inspiration from a 1995 pilot project set up by the AMA involving a few local contractors to collect solid waste in certain areas of the country, which was a success, the WMD by the year 1998 had 80 percent of the collection operations done by the private sector. The reason why the government interfered in the activities of the AMA/WMD was the growing resentment among the general population of the failures of the AMA/WMD to deal adequately with the mounting problems of solid waste collection in Accra despite modest improvement made through its privatization policy such as provision of more personnel, vehicles and equipment. Consequently in 1999, a joint Canadian-Ghanaian private partnership called City and Country Waste (CCW) was granted monopoly of solid waste collection (SWC) in Accra.

The AMA assumed a supervisory role and handed over all its equipment and workshops to CCW. However, in 2001 City and Country Waste had to leave because their activities were too expensive for AMA to pay: a ton of waste collected cost the AMA about 30 US dollars.

AMA therefore once again took charge of waste handling but this time it handed over about 80% of the collection, transportation and disposal of the solid waste to local contractors. However, the changes in the present order may have inevitably affected the lives of millions of most vulnerable and marginalized population in the cities of the developing counties both as users and providers of the service.

Private sector participation in waste management has been concentrated in waste collection. In the Greater Accra region, Accra has been demarcated into 6 waste collection zones. These zones are awarded to waste collection companies for fees, which are charged according to specific contractual agreement they have with the City Authority. In low-income areas such as Kaneshie, Bubuashie, Odorkor, the central container system is in operation. Containers are placed at designated points for households to dislodge their domestic waste for onward carriage to final waste disposal and incineration sites. Under this system the companies are paid according to the total tonnage conveyed to the final disposal point. Households pay no or token fees for waste generated.

In 2009, the Mayor of Accra met with the stakeholders in the waste management and came up with a new refuse collection system termed Fee and Performance Base Solid Waste Collection System where waste companies have been awarded waste management contracts for a specific area and held responsible for the cleanliness of these areas. In the awarding of the contracts, it went through the tendering process and finally, out of the eleven sub-metropolitans of the AMA, Zoomlion Ghana won three of these sub-Metropolitans namely; Ayawaso West, Ayawaso Central and Ablekuma Central. Liberty Waste Limited and Asadu Royal Limited won Ablekuma South and Ablekuma North respectively. Daben Cleansing Limited, Jekora Ventures and J. Stanley Owusu and Co got La, OSU Klottey and Okaikoi

South sub-Metropolitans respectfully. The remaining of the sub-Metros went to Meskworld Limited for Ashiedu Keteke, Yafuru, Almanuel and Catrol for Okaikoi north and Aryeetey Brothers and Co for Ayawaso east sub-Metropolitans.

The new system then commenced from 1st June , 2009 and every house, shop, institution, office, chop bar, plantain roaster stands, kiosks is required to register with the accredited waste management company for a particular sub metropolitan and receive a waste bin free of charge and for it to be lifted regularly when filled.

In return for the services rendered, residents are required to pay a token fee to these accredited waste management companies. Low, middle and high income areas are expected to pay GH¢3.50, GH¢9 and GH¢14 per month respectively. The AMA also supplied 5,000 free waste bins to compliment the role of the private sector.

A number of governmental, non-governmental and donor agencies are directly or indirectly responsible for the improvement of the solid waste management services, environment, and health and sanitation condition of Ablekuma Central sub Metropolitan and the country at large.

Zoomlion Ghana one of the private waste management organizations which is the only waste company which operates in the study area was established in 2006 has quickly become the largest waste management company in Ghana and is quickly becoming the biggest waste management company on the continent (Available at : www.zoomliongh.ltd.com).

Zoomlion Ghana operates in almost of all districts of Ghana and is also operating in a number of West African and South African countries: Nigeria, Togo, Guinea, Sierra Leone, and Angola.

Negotiations are on-going to begin operations in the following countries Nigeria, Liberia, Zambia, Sierra Leone, and Ivory Coast.

The company is in association with Zoomlion China, manufacturers of quality and durable waste management vehicles and equipment with over 50 years' experience in the waste management sector in China. Zoomlion Ghana has also exchanged ideas with international waste management companies like TEDCOR (PTY) Limited, South Africa. This is a south-south arrangement for technical cooperation and capacity building and training exposure for delivering quality and affordable solutions based on technical innovations. Staff members of Zoomlion Ghana have also had the opportunity of exchanging ideas with personnel from experienced waste management companies like Wasteman Pambilli also of South Africa, Nehlsen of Germany, Hubei of China, Ashock Leyland and Mahindra, truck companies in India.(available at www.zoomliongh.ltd.com)

Zoomlion Ghana strives to bring management and technical expertise to the competitive field of waste disposal in Ghana and Africa. Zoomlion boasts of an impressive fleet of modern waste disposal vehicles and prides themselves in their use of appropriate and modern technology to manage waste. Zoomlion is on the cutting edge of waste management technology in Ghana. They are currently constructing the first industrial scale mechanical waste separator and composting facility. Zoomlion focuses on excellent customer service and satisfaction, offering complete solutions for all their customers in waste management needs.

Zoomlion Ghana is committed to building long-lasting relationships with their private sector customers, Ministries, Departments and Agencies (MDAs) of Central Government,

Metropolitan, Municipal, and Districts Assemblies (MMDAs), and the communities they serve not excluding even their competitors in the industry, who they would prefer to refer to as partners in the business of keeping Ghana clean, green, healthy and salubrious. (available at www.zoomliongh.ltd.com)

1.2 Statement of Problem

Generation of solid waste is not a new phenomenon; it has been named a dangerous status of being "third pollution" after air pollution and water pollution with progress in industrialization and population explosion. A number of governmental, non-governmental and donor agencies are directly or indirectly responsible for the improvement of the solid waste management services, environment, and health and sanitation condition of Ablekuma Central Sub Metropolitan and the country at large.

Owing to the challenges faced by government in management of solid wastes in the country, opportunity has been given to private companies to participate in the solid waste management for which Zoomlion Ghana is one of such companies. The question this study seeks to address is to what extent has solid waste management in Ablekuma Central Sub-metropolitan area improved since the involvement of Zoomlion Ghana Limited?

1.3 Objective of the Study

The research objectives are to:

1. Describe the solid waste situation in Ablekuma Central sub-Metropolitan area before and after private sector involvement in waste management in the area.
2. Identify the strategies of Zoomlion Ghana in solid waste management in Ablekuma Central sub-Metropolitan area.

3. Find out the effectiveness of the strategies of Zoomlion Ghana in solid waste management in the Ablekuma Central sub-Metropolitan area.

4. Examine the challenges that Zoomlion Ghana encounters in management of solid waste in the Ablekuma Central sub-Metropolitan area.

5. Assess the benefits of private sector participation in waste management in Ablekuma Central sub-Metropolitan area.

6. Identify ways of sustaining private sector participation in waste management in Ghana.

1.4 The Research Questions

These research questions guided the topic under study:

1. What are the strategies used by Zoomlion Ghana in solid waste management in Ablekuma Central sub-Metropolitan area?

2. How effective are the strategies of Zoomlion Ghana in solid waste management in the Ablekuma Central sub-Metropolitan area?

3. How is the solid waste situation in Ablekuma Central sub-Metropolitan area before and after private sector involvement in waste management in the area?

4. What are the challenges that Zoomlion Ghana encounters in management of solid waste in the Ablekuma Central sub-Metropolitan area?

5. What are the benefits of private sector participation in waste management in Ablekuma Central sub-Metropolitan area?

6. How do we sustain private sector participation in waste management in Ghana?

1.5 Significance of the Study

Solid Waste Management (SWM) is a crucial public service issue affecting both environmental sanitation and health. The challenges of Solid Waste Management in Ghana

has always been, and will continue to be one of the most pressing challenges facing city authorities for the coming years. The degree of the problem increased with the rapid population growth and the fast-growing urbanization rate. With the emergence of private sector participation in the management of the solid waste there is the need to identify their role in the industry. The study will highlight the benefits and the challenges of the private sector participation in the waste industry with particular reference to Zoomlion Ghana service delivery in Ablekuma Central sub-Metropolitan area. The study will also serve as a guide for future research into private sector contribution to waste management in the country.

Furthermore, the study will enable management of the service operators know how residents of Ablekuma Central sub-Metropolitan perceive their role in solid waste management in the area.

1.6 Operational Definitions of Terms

In the course of presenting the case study some terms that were used and some that assume a meaning peculiar to the local area were discussed to avoid ambiguity. These words are listed below with the sense they are used.

Solid Waste Management (SWM): refers to the collection, transportation, treatment, final disposal and recycling of solid wastes.

Recycling: is the process of collecting and preparing recyclable materials and reusing the materials in their original form or using them in manufacturing processes that do not cause the destruction of recyclable materials in a manner that precludes further use.

Disposal of Waste: final handling of solid waste following collection, processing or incineration.

Disposal: most often means placement of waste in a dump or landfill.

Enforcement: administrative or legal procedures and actions to require compliance with legislation, regulations or limitations.

Municipal/Domestic Waste: generally liquid and solid waste originating from a mixture of domestic (household), commercial, and industrial sources.

Reuse: application of appropriately treated materials for a constructive purpose.

1.7 Organisation of the Study

The study is organised in six chapters. Chapter one consists of introduction of the study. This comprises the background of study, statement of the problem, objectives of the study, research questions, the significance of the study, operational definition of terms as well as the organisation of the study.

Chapter two presents the theoretical framework and the literature review, while chapter three describes the research methodology used to conduct the research.

Chapter four presents results while chapter five covers the discussion and finally, chapter six presents the summary, conclusion and recommendations of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Introduction

This chapter presents a review of the literature on solid waste management. It is divided into two parts. The first part talks about the theoretical framework while the second part deal with issues related to the study which include concepts in solid waste management; solid waste management, waste problems in developing countries, impacts of solid waste management activities in developing countries, causes of the solid waste problem in developing countries, types of private sector participation, private sector solid waste management experiences in Africa, public service delivery and decentralisation in Ghana, some strategies of Zoomlion Ghana.

2.1 Theoretical Framework of the Study

The theory of participation has shown that decentralization of governance enhance effectiveness and efficiency. Decentralization involves three dimensions namely political, financial and administrative which are primarily the main components of power.

Political dimension**,** also known as political decentralization it refers to the transfer of political authority to the local level. Generally decentralization is about power shifting, it is therefore a fundamentally political process.

Financial dimension commonly referred as financial or fiscal decentralization. It involves shifting of financial power to the local level through increasing or reducing conditions on the inter- governmental transfer of resources while giving jurisdictions a greater authority to generate their own revenue.

Administrative dimension, or administrative decentralization, it engages a full or partial transfer of a range of functional responsibilities to the local level such as in this case the waste management. However decentralization tends to be strong when the three mentioned dimensions are all transferred to the local level together (Technical Planning Committee, 2000).

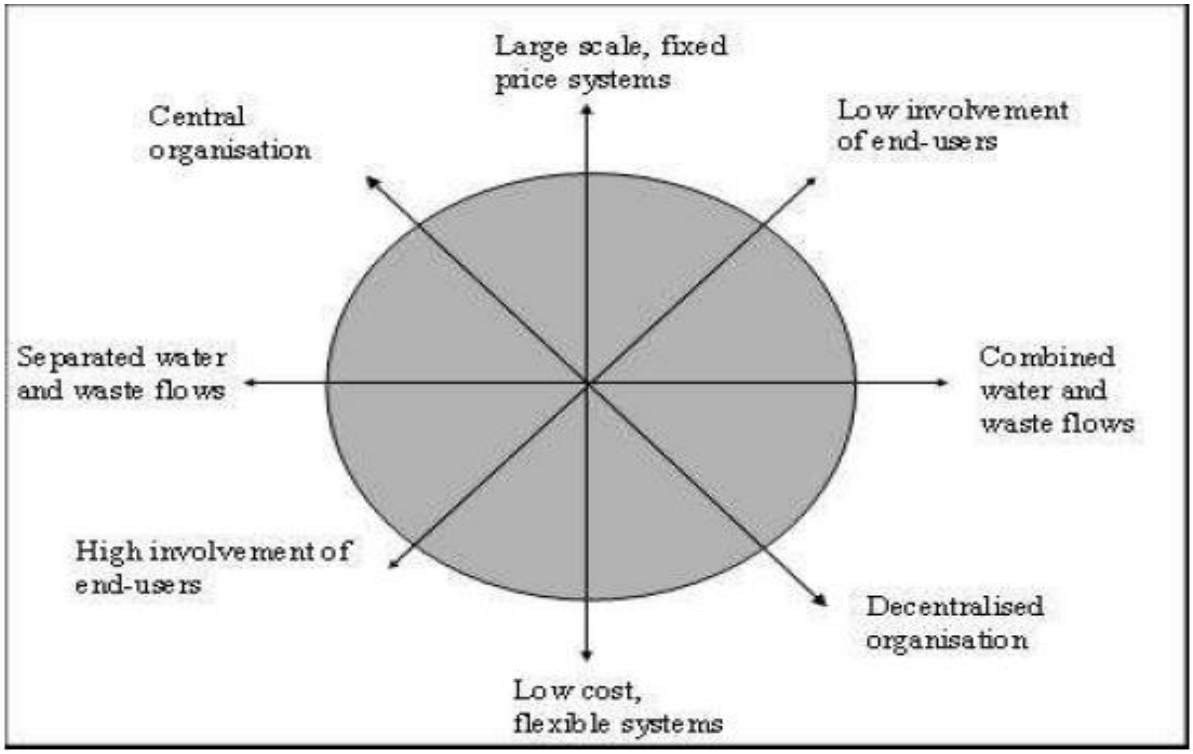
Decentralization processes vary significantly even between countries of similar political and cultural status. This is because each country faces its own unique combination of issues. In many parts of the continent, decentralization has been facilitated by the international organizations. For example, in Uganda the decentralization process was being supported under the World Bank financed Environment Management Project in 1996. In Accra Ghana, a regional initiative named Managing Environment Locally in sub Saharan Africa was being facilitated also by the World Bank with the aim of generating grounds for privatizing the management of solid waste. Privatization of solid waste management services is an alternative to the government managed operation (ADB, 2002). With the theory of participation, the end- users are given the opportunity to be part of the decision making process which encourages bottom –up approach.

An important aspect of decentralization is that it is expected to contribute to the elements of good governance through increasing community participation in decision making and enhancing government responsiveness, transparency and accountability. However these expectations are not always met because of the complex system that is attached to many geographic entities such as international, national and local levels and societal factors involving the government, private sectors and the community at large (Technical Planning Committee, 2000).

The theory of participation is supported by the theory of Modernised Mixtures Approach (MMA) which refers to the development of medium and large scale environmental infrastructural systems which 'build upon' and are constructed from decentralized and centralized units, which take into account of specific local conditions of developing countries. Modernised Mixtures Approach integrates technological, economic and social dimensions of environmental infrastructures (Spaargaren et *al*, 2005). The approach is made up of three criteria of accessibility, flexibility and sustainability. Modernised Mixtures Approach has principles of mixed scales strategies, technology, payment systems and decision making. It is referred to as 'mixtures' because it take the best features out of both decentralized and centralized systems, and combine these features into new forms which fit better with the local situation of African cities (Spaargaren *et al*, 2005).

As shown in Figure 1 below, there are two systems for provision for solid waste management in developing countries. The first system on the top half circle is a *Centralized* waste management system. Inherited from colonial ruling, the centralized waste management systems have characteristics of being large scale and have combined flows. The prices in centralized system are fixed by the government. The systems are centrally managed by government and have low involvement of end users. Because of government monopoly, centralized waste management systems have very limited competitions and are often of poor service provisions. The centralized systems involve high maintenance costs and are associated with constant break down due to large-scale nature. The centralized waste management systems are more prone to breakdown when there is political instability in developing countries. When the solid waste management in Ablekuma Central sub-Metropolitan was the sole responsibility of central government the end-users were not actively involved in the management process and service delivery was no encouraging.

Figure 1: Modernized Mixture Approach



Source: Spaargaren et al, 2005.

The second system on the bottom half circle is *Decentralized* waste management system with self- sufficient (autonomous) management. The system is characterized by having separate small-scaled flows and flexible management systems with high involvement of end users. Such decentralized systems include small scale private waste collection systems, small scale composting and informal recycling projects. Decentralized system manages flow of materials close to production areas hence are being considered to have low cost of management. The decentralized system seems to work better in provisions of urban infrastructures, especially in situations where centralized system is not yet in place and in situations where the end users of these systems strive to function independent from higher level institutions and authorities (Spaargaren *et al*, 2005).

The Modernized Mixtures Approach helped to understand the participation of Zoomlion Ghana in solid waste management practice in Ghana with particular reference to Ablekuma Central sub-Metropolitan Area. The management of solid waste by Accra Metropolitan Assembly had a lot of challenges amongst them were frequent breakdown of their truck, inability to collect waste from designated waste collection points increase in the assembly's expenditure on waste management. Due to the huge sum of money being spent on waste management by the assembly without involving the end-users the, assembly decided to decentralize the management of the waste in the area. With the application of Modernised Mixture Approach it has given the opportunity to Zoomlion Ghana to contribute their quota to the solid waste management in Ghana, it has actually given a new dimension to the existing situation.

2.2 Solid Waste Management

Solid waste management in Ghana is a complex issue that has been a major feature on the priority list of successive governments, local authorities, and international donors in recent years. Generally existing public facilities including sanitary facilities are inadequate to serve the user population, and the sheer volume of municipal solid waste generated in the country's urban centres is overwhelming (Sam Jr., 2009). Tchobanoglous et al., (1993) also define Solid Waste Management (SWM) as managing the processes involving solid waste collection, treatment and disposal of waste generated in households, commercial and business establishments, institutions, and non-hazardous industrial process waste. Othman (2002:2) defined solid waste management as the control of waste generation, storage, collection, transfer and transport, processing and disposal of solid wastes consistent with the best practices of public health, economics, and financial engineering, administrative, legal

and environmental considerations. The term usually relates to materials produced by human activity, and is generally undertaken to reduce their effect on health, the environment or aesthetics. Waste management is also carried out to recover resources from it. Waste management can involve solid, liquid, gaseous or radioactive substances, with different methods and fields of expertise for each. Waste management practices differ for developed and developing nations, for urban and rural areas, and for residential and industrial producers. Management for non-hazardous residential and institutional waste in metropolitan areas is usually the responsibility of local government authorities, while management for non-hazardous commercial and industrial waste is usually the responsibility of the generator.

The escalating problem on solid waste management in Ghana is due to various factors. Problems such as rapid urbanization, financial incompetence of local authorities, lack of proper planning and management equipments for solid waste disposal have together escalated the already grave problem of solid waste disposal (Web Government, 2011).

Existing final disposal sites for municipal solid waste in Ghana are not engineered and may be described as crude dumpsites (Sam Jr., 2009). There is no waste separation at the sources of generation, and hazardous and clinical wastes are often handled together with municipal solid waste. The situation creates a suitable environment for breeding of disease vectors such as mosquitoes and cockroaches and the proliferation of rodents such as rats and mice (Sam Jr., 2009).

2.3 Waste Generation

In Africa thousands of tons of solid waste are generated daily and most of it ends up in open dumps and wetlands, contaminating surface and ground water and posing major

health hazards. Generation rates, available only for selected cities and regions, are approximately 0.5 kilograms per person per day in some cases reaching as high as 0.8 kilograms per person per day (Environmental Guidelines for Small-Scale Activities in Africa, 2009). On a daily basis, each household generates garbage or waste items that are no longer needed or which are not being used fall in the category of waste and we tend to throw them away (Danso, 2011). Danso (2011) also indicated that, in the 2000 Population and Housing Census, Ghana's population was18.9 million. With an average daily waste generation per capita of 0.45 kg, Ghana generates annually about 3.0 million tons of solid waste. Accra, the capital, and Kumasi, the second largest city, with a combined population of about 4 million and a floating population of about 2.5 million generate over 3,000 tons of solid waste daily. According to Kumasi Metropolitan Assembly (2006), the current domestic waste generation in Kumasi rate was approximately between 1000-1500 tonnes a day. It is established that population growth greatly contributes to an increase in waste production, it has also been empirically established that waste generation has increased rapidly over the years (Martin, 2011).

The residents of Accra currently generate large amounts of solid waste, beyond the management capabilities of the existing waste management system, because the solid waste infrastructure is inadequate, over 80 percent of the population does not have home collection services (Boadi and Kuitunem, 2005). Only 13.5 percent of respondents are served with door-to-door collection of solid waste, while the rest dispose of their waste at communal collection points, in open spaces, and in waterways. The majority of households store their waste in open containers and plastic bags in the home (Boadi and Kuitunem, 2005). According to Anomanyo (2004) about 1800 tonnes of municipal solid wastes were generated per day in the Accra Metropolis and the average waste generated per capita

per day was estimated at 0.5 tonnes .This was based on the projected population of 1,610,867. The waste generation rate of AMA was about 2000 tonnes a day with per capita waste generation of 0.45kg (Urban sector assessment report, (2008). According to Tuani (2011), in spite of the strategies put in place for the collection of waste in Accra, all is not well for maximum waste collection. According to the Waste Management Department (WMD) of the Accra Metropolitan Assembly (AMA), only 45% to 55% of waste generated everyday is collected. In Tamale for example, the amount of solid waste generated per day was 150tonnes in 2009 (Abankwa *et al*., 2009) and currently 810 tonnes per day (Puopiel, 2010) as cited in Tia 2012.

Residential waste quantities are determined by population and generation rate (pounds per capita per day). The generation rates will vary based on the level of disposable income available to a community to spend on goods and services. (Gershman *et al*., 1986). Nationwide estimates of the rate at which municipal solid waste is generated have been developed by public and private organizations. These estimates are simply average generation rates, which fail to account for local variations in income level and the types of businesses and institutions in a particular community. With these average generation rates and population data a rough calculation can be made of the quantity of residential, institutional, and commercial and light industrial solid waste discarded. (Gershman *et al*., 1986).

Developing countries have solid waste management problems different from those found in fully industrialized countries; indeed, the very composition of their waste is different from that of developed‘ nations. Although low-income countries solid waste generation rates average only 0.4 to 0.6 kg/person/day, as opposed to 0.7 to 1.8 kg/person/day in fully

industrialized countries (Zerbock, 2003).

2.4 Waste Collection

Throughout most of sub-Saharan Africa solid waste generation exceeds collection capacity. This is in part due to rapid urban population growth: while only 35% of the sub-Saharan population lives in urban areas, the urban population grew by 150% between 1970 and 1990 (Environmental Guidelines for Small-Scale Activities in Africa, 2009).

According to Anomanyo (2004), solid waste collection in the city is both on franchise and contract basis. On franchise basis, a house-to-house collection is done in high income areas and the contractors charge the households some fees with weekly collection frequency. These areas are well- planned residential areas with access roads described as first and second class areas and include areas as Airport residential area and Cantonments. Each household has plastic containers with covers. These contractors then pay a tipping fee to the AMA for the use of its dump site (Anomanyo, 2004). He also mentioned that, there are three modes (curbside, communal container and house-to-house) of solid waste collection in Accra.

According to Kumasi Metropolitan Assembly (2006), there are two modes (house-to-house and communal) of solid waste collection in Kumasi Metropolis. The total waste collected on the average was 545 tonnes/day out of 1200 tonnes/day in Kumasi. Kumasi Metropolitan Assembly and the private companies collected on the average about 55% (545tonnes) of solid waste generated in Kumasi with the remaining 45% partly recycle/reuse and partly uncollected and indiscriminately disposed off within the environment creating aesthetic nuisance and health problems (Oduro-Kwarteng *et al*., 2006). The private companies collected 501 tonnes/day whiles Kumasi Metropolitan

Assembly collected 44 tonnes/day.

In low income communities characterized by limited access to refuse collection trucks or carts, door- to-door collection services is not economically feasible, and only a communal container or bell system is viable (Cointreau-Levine, 1994). Collection by communal systems inherently involves collection from a public area not from a private establishment or household and requires the participation of the residents who bring their refuse to a communal container or to an attending refuse collecting vehicle (upon belling) (Cointreau-Levine, 1994). These containers are therefore placed at certain vantage points where the population is high and the trailers accessible. There are no household collection points. Instead, individuals, mostly children, carry the waste to the disposal points, which in certain areas are as far as about 200m away from their houses.

Anomanyo (2004) also added that, residents at Chorkor for instance, with a population of 45,379 have only two collection points where each of these points has two old containers. These are filled to the brim in the early hours of the morning and latecomers are turned away by the attendants. In the absence of attendants, garbage is left there and accumulates on the ground. The collection of waste from dust bins is planned in accordance with frequency of container becoming full. The present location of dust bins and the waste collection point have been classified into daily collection (A type), weekly twice collection (B type) and weekly once collection (C type) as part of Nirmal Nagara Programme. In addition, there are 20 dumper placer containers used as primary collection containers in commercial areas and bulk generator (Chandra and Linthoingambi, 2009).

Recommended frequency of waste collection

Region	Season	Frequency
Tropics	Dry	Daily
	Wet	Daily
Temperate	Summer	Every 2days
	Winter	Every 3 days
Cool Climates	Summer	Twice a week

Source: Environmental Guidelines for Small-Scale Activities in Africa (EGSSA) 2009

2.5 Waste Transportation

Waste transfer stations are facilities where municipal solid waste is unloaded from collection vehicles and briefly held while it is reloaded onto larger long-distance transport vehicles for transport to landfills or other treatment or disposal facilities (US EPA, 2011). Transfer stations are not common in municipal waste management in African cities. One such facility, operated by the City of Abidjan, Cote d'Ivoire, is no longer functional. In almost all cases, the point of disposal of the Municipal Solid Waste is located on the perimeter of the city, within easy reach of vehicles and collection crews. The collection vehicles are generally of the 6 - 7 m^3 capacity and go directly from their point of last pickup to the disposal site (Palczynski, 2002). Vehicles or containers used for the collection and transportation of solid waste shall be loaded and moved in such a manner that the contents do not fall, spill or leak. Covers shall be provided to prevent littering and spillage. If spillage does occur, the operator shall immediately return spilled materials to the vehicle and shall properly clean the spill area. In the event of a spill of a hazardous substance the department shall be notified.

Ministry of Environment and Forestry Notification, (2000) also indicated in their criteria for the transportation of MSW that, vehicles used for the transportation of waste shall be covered. Waste should not be visible to the public, nor exposed to open environment

preventing their scattering. The criteria also indicated that storage facilities set up by municipal authorities shall be daily attended to for clearing of waste. The bins or containers wherever placed shall be cleared before they start overflowing. Transportation vehicles shall be so designed that multiple handling of waste, prior to final disposal, is avoided. Downmore *et al.,* (2011) reported that in Chinhoyi municipality in Zimbabwe, an open 7-ton truck and two tractor drawn trailers are used to collect and dispose MSW. He also mentioned that, the waste at times was blown away by wind from the open truck and tractor trailers, resulting in pollution of the environment.

2.6 Waste Processing

No significant waste recovery and reuse activities exist in Accra. Waste pickers are involved in a small-scale recovery and reuse operation (Palczynski, 2002). It was also contained in the criteria of Ministry of Environment and Forestry Notification, (2000) that municipal authorities shall adopt suitable technologies or a combination of technologies to make use of waste so as to minimize burden on landfill.

Some of these technologies include composting biodegradable wastes, vermicomposting, anaerobic digestion or any other appropriate biological processing for stabilization of waste.

Mixed waste containing recoverable resources shall follow the route of recycling. Incineration with or without energy recovery including pelletisation can also be used for processing waste in specific cases.

2.7 Waste Disposal

Solid waste disposal in Ghana is a grave cause of concern and the chief areas of problems are indiscriminate dumping, lack of fitting disposal sites, troubles with proper solid waste disposal due to deterioration of road ways and escalating traffic woes. There is also no substitute for transportation (Web Governments, 2011). Ghana like most developing

countries is faced with serious solid waste management problems.

All over the country solid waste is ultimately disposed of in both authorized and unauthorized waste dumps. 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, without due regards to the nuisance and harm caused to the environment.(Ghana Landfill Guidelines Environmental Protection Agency, 2002). The methods for solid waste disposal in Ghana are: uncontrolled dumping of refuse controlled dumping, sanitary land filling, composting, and incineration (Danso, 2011).

2.8 Ways of Solid Waste Management

2.8.1 Recycling

Recycling is the process by which the materials in consumer goods are returned to the production facility and remade into new products. There are two basic types of recycling: post-consumer and pre-consumer. Post-consumer recycling involves products that consumers, rather than industry or producers, have recycled. Aluminum cans, plastic bottles and newspapers are typical materials involved in post-consumer recycling while pre-consumer recycling involves recycling the materials at the production facility. For example, a plant that makes plastic bottles may recycle any rejected bottles which do not fit certain specifications. It is material that a consumer has never purchased.

2.8.2 Composting

Composting is the biological decomposition of organic material under aerobic conditions. This process is used to recycle organic yard wastes and household food wastes. During the composting process, bacteria and other micro-organisms change the organic matter into humus, an important component of fertile soil. The composting process takes about a year.

Composting is one way to ensure that the nutrients from waste materials are returned to the soil to be used by other organisms, just like they would be in natural systems.

2.8.3 Landfills

Municipal solid waste originates in homes, businesses, and other urban areas. There are different ways to manage the solid waste produced in mining, processing, manufacturing, and using resources, but most can be categorized into two different approaches. The high-waste approach involves leaving it somewhere, burning it, or burying it (in a sanitary landfill or any hole in the ground). The low-waste approach is two-fold: attempting to produce as little solid waste as possible, and diverting as much solid waste away from landfills and incinerators (Miller, 1990). Over the past few years, the former has been viewed as cheap and irresponsible, and the latter has been viewed as initially expensive but morally gratifying. People are sick of looking at and living with the landfills. Landfills are clearly the largest refuse heaps in the world (Gore, 1992).

2.8.4 Incineration

Burning solid waste in incinerators kills disease-carrying organisms and reduces the volume of waste by 90% and weight by 75 %(Miller, 1990).

In waste-to-energy incinerators, the heat released from the burning of solid waste can be sold to generate electricity. Unfortunately, the good news ends there. Municipal solid waste incinerators emit small but noticeable amounts of lead, cadmium, mercury, and other toxic substances into the air we breathe. The most frightening item piped into the atmosphere is dioxins, which are carcinogenic (Miller, 1990).

2.8.5 Reducing and Reusing

To reduce solid wastes, people must reduce discarded products. We can cut down on the amount of trash we produce by buying things with changed product packaging and content. This is buying items from companies that use recycled products. It is called pre-cycling, and the whole process of recycling what you buy and buying recycled things is called completing the cycle. Reducing and reusing will not work unless a market exists for this material, and the consumers of these recycled goods should be the public (Young, 1995).

Some ways to reduce consumption include; reducing the amount of packaging; reducing the number of individual packages; using less material to make a product and buying only what you can consume. Concentrated juices and laundry detergents require fewer packaging materials.

Reusing materials multiple times or for another purpose can also save on solid wastes. Some examples of this include, refilling a water bottle rather than buying a new one; reusing newsprint as a paper towel to clean items and soak up liquids; using re-useable cloth napkins instead of paper napkins; reusable cups instead of paper cups; and reusing grocery bags for garbage collection.

Generally, high-income areas generate more waste than low- or middle-income areas. Thus, waste generation and composition may differ greatly even within the same metropolis. Waste collected in affluent areas is typically less dense, as it contains more packaging and other lighter materials and less ash and food waste. This is because more ready-made products are consumed and the food processing takes place in the commercial or industrial sector. The moisture is greater in lower-income areas due to the water content of the food waste and smaller amounts of paper and other dry materials.

Table 2: Percentage of Waste Disposed

Continent	Percentage of waste disposed by					
	recycling	Sanitary Landfill	Open Dump	Incineration	Open Burning	Others
Africa	3.9	29.3	47.0	1.4	9.2	8.4
Asia	8.5	30.9	50.9	4.7	1.7	4.5
Europe	10.7	27.6	33.0	13.8	11.8	4.4
North America	8.1	91.1	0	0	0	0
Latin America	3.2	60.5	34	2	5.5	2

Source**:** Statistics are from UNEP-ISWA State of the Waste Industry, prepared for WSSD, Basel Convention Secretariat, United Nations Human Settlements Programme (UN Habitat) - Global Report on Human Settlements 2003, US Environment Protection Agency, Planet Ark World Environment News, United Nations Environment Programme and Beigl et.al. University of National Resources and Applied Life Sciences, Vienna, Austria.

2.9 Waste Management Regulation and Policy in Ghana

General Waste Management in Ghana is the responsibility of the Ministry of Local Government and Rural Development, which supervises the decentralized Metropolitan, Municipal and District Assemblies (MMDAs). However, regulatory authority is vested in the Environmental Protection Agency (EPA) under the auspices of the Ministry of Environment and Science and Technology. The Metropolitan, Municipal and District Assemblies are responsible for the collection and final disposal of solid waste through their Waste Management Departments (WMDs) and their Environmental Health and Sanitation Departments. The policy framework guiding the management of hazardous, solid and radioactive waste includes the Local Government Act (1994), Act 462, the Environmental

Protection Agency Act (1994), Act 490, the Pesticides Control and Management Act (1996), Act 528, the Environmental Assessment Regulations 1999, (LI 1652) the Environmental Sanitation Policy of Ghana (1999), the Guidelines for the Development and Management of Landfills in Ghana, and the Guidelines for Bio-medical Waste (2000). All these Acts and Regulations emanate from the National Environmental Action Plan.

The only guidelines, which indirectly discourage unsustainable practices and promote sustainable consumption and production, are those on the Environmental Impact Assessment. Standards relating to pollutants into the atmosphere (air, water and land) have also been prepared to ensure that production/consumption activities are sustainable. Environmental Impact Assessment is a requirement under legislation (Act 490) and guidelines have been prepared through the Environmental Protection Agency with private sector collaboration. These guidelines and standards are mandatory for the execution of all major projects in the country. The MLGRD (2004) contains waste management regulations and policies to guide the operations of the public and private solid waste management institutions in the country. Some of these waste management regulations and policies contained in the MLGRD (2004) pertaining to the public and private sectors are presented below.

Role of the Public Sector

The policy states that:

(a) Government and the Assemblies shall establish an enabling environment at all levels by enacting appropriate legislation, harmonizing byelaws governing environmental sanitation service and developing standard contract and franchise documents; (b) Contracts, leases, franchises etc. Must be clearly defined and awarded transparently and in such a way as to ensure active and fair competition;

(c) Strong and effective supervisory, licensing and performance measurement systems shall

be implemented by the Assemblies;

(d) Assemblies must closely monitor costs (both internally and in the private sector), including the full cost of replacing capital equipment, so as to ensure the fixing of realistic and economically viable tariffs;

(e) The assemblies shall carry out public education campaigns to raise the status of environmental sanitation, public awareness of the costs involved and understanding of the need to pay for it;

(f) The Assemblies shall enforce public participation in franchised services such as solid waste collection which have an impact on community well-being.

(g) The Assemblies shall establish hire purchase arrangements for the transfer to the private sector of the environmental sanitation plant and equipment they own; Government shall revise the investment code to facilitate the import and reduce taxation of capital equipment for environmental sanitation.

The Role the Private Sector

The bulk of environmental sanitation services shall be provided by the private sector, including NGOs and community based organizations under the supervision of the Public Sector, especially the Metropolitan, Municipal and District Assemblies. The public sector shall maintain adequate capacity to provide not less than 20% of the sanitation services and reserve the right to take measures to intervene and provide the services in the event of failure of the private sector to deliver the services due to industrial actions in their establishments or other reasons.

The private sector shall operate within policies, regulations, supervisory and licensing arrangements set up by the public sector to promote efficiency and competitiveness. No single private sector organization shall be given monopoly in the delivery of sanitation

services in anyone human settlement except in settlements with a population of 15,000 or less. In all other settlements, the town/city shall be zoned for purposes of sanitation services delivery. Where possible, environmental sanitation services shall be provided by the private sector on a full cost recovery basis, under franchise or concession agreements. Where full cost recovery is not possible the Assemblies may enter into contracts with service providers. The following services shall be undertaken by the private sector:

(a) Provision and management of septage tankers, on a fully commercial basis subject to licensing and the setting of maximum tariffs by the Assemblies;

(b) Construction, rehabilitation and management of all public baths and toilets, subject to the supervision and setting of maximum tariffs by the Assemblies;

(c) Solid waste collection from individual institutional or domestic customers, subject to the supervision and setting of maximum tariffs by the Assemblies;

(d) Solid waste collection from communal containers under contract to the Assemblies, Unit Committees or community groups or as part of a franchise covering both high and low income areas;

(e) Cleansing of designated areas and facilities (streets, drains, markets, lorry parks, etc.) and maintenance of drains, under the agreements covering solid waste collection.

2.10 Waste Problems in Developing Countries

Even though data is generally lacking in the waste sector of developing countries, available studies on the topic suggest that solid waste management is generally characterized by inefficient collection methods, insufficient coverage of the collection systems and improper disposal of municipal waste (Onibokun and Kumuyi, 1999; Hardoy et al., 2001; Pacione, 2005). In 2002, the United Nations Centre for Human Settlement (UN-Habitat) raised concern about the solid waste situation in poor country cities in the following words: “The

need for the collection and disposal of solid waste in urban settlements is far from adequately recognized. Uncollected refuse accumulates in drains, roads and open spaces, disrupting community life and creating additional problems in the operation of other public services" (Habitat 2002:online)

From different parts of Africa, studies have documented the abysmal solid waste situation in major cities. In 1989 for example, Adelibu and Okenkule investigated the solid waste situation in Nigeria's commercial capital Lagos, where they found that "in many parts of the city, streets are wholly or partially blocked by solid waste. Similarly, open spaces and marketplaces are littered with solid waste. In most cases, drains are clogged or totally blocked and many compounds are hemmed in by solid waste" (Cited in Achankeng, 2003:16).

Another Nigerian city reported to have a severe municipal waste problem is Port Harcourt, River State. According to Palczynski and Scotia (2002) the city which was once known as the "Garden City" for its trees and clean streets has now gained the nickname "Garbage City" because of the dire waste situation which now characterizes it. Dakar produces about 1,100 tonnes of solid waste each day but most of the waste remains uncollected (Palczynski and Scotia, 2002). According to Palczynski and Scotia (2002:12), "discarded paper, fruit skins, old cloths and other wastes have become part of the landscape of the West African town where just about every street is lined with waste and overflowing refuse bins go un-emptied for many days".

Other studies have presented similar findings. In Bamako, the capital city of Mali, Klundert and Lardinois (2005: online) have reported the "depressing waste disposal situation which has become an environmental issue of major concern". The solid waste disposal situation in

Lusaka, Zambia, is also reportedly bad, with 90 per cent of the 1400 tonnes of daily waste output left uncollected, causing a nuisance and public health risk to the population (Hardoy et al., 2001; Palczynski and Scotia, 2002) while in Uganda, a study by the Namilyango College (2001) of Domestic waste management in Kampala city reported that too much garbage was lying in the streets uncollected, creating a nuisance and environmental pollution and posing a risk for public health. Even though the municipal authorities were applying all the means at their disposal, according to the researchers, the piles of waste only seemed to grow from day to day. Also in Kinshasa (Congo), most of the waste generated in the city is said to be put out on the road, on illegal dumps, in storm water drains or buried in open sites (Hardoy et al., 2001). In Kumasi, Ghana, a study by Devas and Korboe (2000:134) showed that most areas of the city had inadequate waste collection services in addition to other environmental problems.

2.10.2 Solid Waste Management Practices in Developing Countries

Solid waste management constitutes one of the most crucial health and environmental problem facing governments in developing countries (Cointreau - Levine, 1994; Zurbrugg, *et al*, 2006). It has been a local government responsibility to provide this service for decades (Pfammatter and Schertenleib, 1996). This service is nonexclusive, meaning that upon provision it benefits the community as an overall public welfare. The service is also non-rivaled, meaning that any resident can enjoy the benefit of the service without diminishing the benefit to anyone else (Cointreau – Levine, 1994). It is argued that although the service is an important public good, most administrations in developing countries have failed to provide it to a large section of the population

(Cointreau – Levine, 1994; Choguill, 1996; and Bolaane and Ali, 2004). The governments spend about 20- 50% of their budget in solid waste management but only 20 – 80 % of the waste is managed (Schubeler, 1996; Achannkeng, 2003). The main reason for this inability to manage waste is due to rapid population growth coupled with the expansion of cities, diminishing financial resources and poor urban planning (Choguill, 1996, Bolaane and Ali, 2004). It is observed that in developing countries alone, urban population is increases for about fifty (50) million per year with average waste generation rates of 0.4 to 0.6 kg/person/day (Cointreau, 1982; Choguill, 1996). Governments struggle with the problems of high volumes of waste generated; the disposal technologies and costs involved in managing the waste (Furedy 1992; Rotich *et al*, 2006).

Solid waste from municipalities of developing countries contains refuse from households, non-hazardous solid waste from industrial, commercial and institutional establishments (including hospitals), market waste, yard waste and street sweepings (Schubeler, 1996). The composition of solid waste is higher in most of its characteristics when compared to that of developed countries. Wastes have a density of 2-3 times higher; moisture content 2-3 times greater; with large amount of organic waste; dust and street sweepings than industrialized nations. The waste has however smaller particle size on average than in industrialized nations (Cointreau, 1982; Blight and Mbande 1996). Local government authorities incorporate private firms in delivering solid waste management services. These services encompass waste collection and transfer; disposal; recycling and composting; and in few cases resource (energy) recovery. The following is the description of waste management services in developing countries.

Impacts of Solid Waste Management Activities in Developing Countries

Adverse environmental impacts from improper solid waste management are rooted in inadequate collection, recovery of recyclable and disposal of wastes. These impacts are also

due to inappropriate location, design, operation, or maintenance of dumps and landfills. Improper waste management activities are associated with the following environmental impacts:

Threats to Public Health

Rotting organic materials pose great public health risks and serve as breeding grounds for disease vectors. Waste handlers and waste pickers are the most vulnerable people (Muttamara and Leong, 1996). They may be exposed to vectors which transmit diseases when human or animal excreta or medical wastes are in the waste stream. In slum areas where dumpsite is situated or a landfill is wrongly operated, landslides or fires usually destroy homes and injure residents (Johannessen and Boyer, 1999). The accumulation of waste along streets may present physical hazards, clog drains and cause localized flooding (Environmental Guidelines for Small-Scale Activities in Africa, 2006)

Surface and Groundwater Pollution

Municipal solid waste streams can contaminate ground and surface water with toxic waste, heavy metals and pathogenic organisms through leachate (Muttamara and Leong, 1996; EGSSAA, 2006). Leachate is the liquid discharge of dumps and landfills, composed of rotted organic waste, liquid wastes, infiltrated rainwater and extracts of soluble materials (EGSSAA, 2006). Once it reaches the bottom of the dumpsite or an impermeable layer within the landfill, leachate either travels laterally to a point where it discharges to the ground's surface as a seep (El – Fidel *et al*, 1995).

Air and Atmospheric Pollution

When organic waste is disposed off in open dumps, 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 (Muttamara and Leong, 1996; EGSSAA, 2006). Burning of

garbage creates 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) and emission of Volatile Organic Compounds (VOCs) generates highly carcinogenic dioxins and could potentially increase cancer risks to local communities (El - Fidel *et al*, 1997; EGSSAA, 2006).

Ecosystems Damage

When solid waste is dumped into rivers or water streams it can alter aquatic habitats and harm native plants and animals. The high nutrient content in organic wastes can deplete the dissolved oxygen in water bodies, denying oxygen to fish and other aquatic life form.

Solids can cause sedimentation and change stream flow and bottom habitats. Current waste management practices in developing countries of locating dumps in sensitive ecosystems may destroy or significantly damage these valuable natural resources and the services they provide (Beede and Bloom, 1995; EGSSAA, 2006).

Discouragement to Public Private Partnership Efforts

Efforts to strengthen Public Private Partnership are discouraged by illegal and informal waste management practices. Franchisees suffer from unfair competition from informal waste collectors. In many developing countries, such as in Dar-es-Salaam, Tanzania the informal waste collectors provide waste collection services to low - income areas (Cointreau - Levine, 1994). They charge a smaller fee than the franchisees and do not have equipment to travel far to the official disposal site; hence dumping solid waste illegally to low lying areas (International Labour Organisation, 1997). In such cases the franchisee would often feel obliged to clear such unofficial waste and transport the extra waste to the official disposal site which creates extra work and running costs. Such practices discourage franchisees to provide service to low income areas which leaves the areas unsaved.

2.11 Causes of the Solid Waste Problem in Developing countries

Researchers have identified several factors that militate against solid waste management efforts in poor country cities. For instance, Linden et al, (1997) identified nine common constraints to be militating against solid waste management efforts in Asian countries.

These were:

- Inappropriate technologies and processes
- Lack of financing
- Lack of training and human resource
- Lack of political support
- Lack of legislation
- Policy conflict among levels of government and overlapping responsibilities
- Rapid increase in waste generation and limited data
- Lack of awareness among public, and
- Limited land areas; land tenure issues

(Linden et al., 1997).

In a study of the solid waste problem confronting the city of Kampala, Uganda, researchers from the Namilyango College (2001) identified several causes of the waste problem including the lack of dumping sites, ignorance of the masses about the need for proper waste disposal, inefficient collection methods, poor government attitude towards waste management, poverty of the people, corruption among public officials and lack of trained personnel for waste management. These have posed serious constraints to the waste sector and dampened efforts towards waste management in the city. Other writers have also identified the following factors responsible for the abysmal waste situation in poor country cities.

Financial and Economic Constraints

Many writers have cited the scarcity of funds as a major constraint to solid waste management in all developing countries (Cointreau, 2001; Ogawa, 2002; Lohse, 2003; Pacione, 2005). Lohse (2003:4) has described the problem of municipal finance in developing countries as "the gap between financial resources and municipal expenditure needs". According to him, this fiscal gap is widening as urban populations expand, increasing the demand for infrastructure and services including waste disposal. Lohse (2003:4) explains that one reason for the municipal finance gap is that "most municipalities lack the autonomy to establish their tax basis, rate structures, and enforcement procedures, and so cannot raise revenues commensurate with their expenditure requirements".

In the context of Nigeria, Onibokun and Kumuyi (1999) have blamed the lack of fiscal autonomy among municipal governments on excessive central government control of the lucrative sources of revenue, a situation which leaves local governments with few options. Ogawa (2002) has also observed that the finance problem in developing countries is most acute at the municipal government level where the local taxation system is inadequately developed and therefore the financial basis for public services is weak. He attributed the problem of finance to the low capacity of local governments for cost recovery and their heavy reliance on state subsidies for waste management operations. This view is corroborated by Attahi (1999) who investigated the waste problem in Abidjan, Cote d'Ivoire, and found that even with an elaborate system of taxes and levies such as the drainage tax levied on landed properties; state subsidies sustain most municipal programmes including waste management. According to his study, only 30 per cent of the cost of waste management is recovered in Abidjan. Zurbrugg (2002) maintains that the low fees usually charged for waste collection and insufficient funds from central municipal budgets cannot finance adequate levels of service. Ahorlu (2006: online) has also reiterated the finance problem of municipal waste

departments and how it affects waste management operations in African cities. In his paper 'Waste management in Africa a look at institutional constraints, hazardous waste and public-private partnership options', Ahorlu (2006) observed that the "provision of adequate funding for solid waste management on an ongoing basis is a major problem in African cities". In his view, the fact that the huge amounts of money required for running municipal waste management operations usually come from limited municipal budgets calls for efforts to improve the overall municipal financial systems. Cointreau (2001) has also observed that in spite of the deplorable waste situation in poor country cities, it is common for municipalities to spend 20-50 per cent of their available recurrent budget on solid waste management alone. This observation is corroborated by Devas and Korboe (2000) in their study in Kumasi where they found waste management and sanitation to be the largest public sector, with refuse trucks alone consuming 45 percent of the city's recurrent expenditure.

On their part, Tagoe et al. (2005: online) have attributed the finance problem of poor city governments to a lack of good financial management and planning among municipal governments. According to the authors, the lack of financial management and planning particularly cost accounting, "depletes the limited resources available for the waste sector very quickly and causes the solid waste management services to be unreliable, thus losing the trust of service users". Another reason cited for the poor financing of solid waste is that urban environmental management in general, and solid waste management in particular, is given a very low priority in developing countries (Onibokun and Kumuyi, 1999). As a result, very limited funds are usually provided to the sector by both national and local governments and the level of service required to protect public health and the environment cannot be attained (Ogawa, 2002).

Armah (1993) has also attributed the financial difficulty of municipal governments to over reliance on central government subventions for the provision of municipal service. According to him, any organization that relies so much on central government subventions to operate a waste management service is bound to fail because such subventions are often limited and unreliable. As a solution to the crippling municipal financial problem, Lohse (2003) has suggested a number of sources from which local governments may raise revenue for municipal infrastructure and service finance including internal and external sources. While some of the sources are already being explored, corruption and inefficiency usually constrain efforts to raise revenues (Armah, 1993; Ogawa, 2002). Besides, the technical capacities and political will to raise revenues from the sources suggested by Lohse seem to be lacking among many municipal governments across the developing world Ogawa (2002) has observed that economic and industrial development play key roles in solid waste management because an enhanced economy provides a more sustained financial base and enables more funds to be allocated for solid waste management while a sound industrial base enables a country to produce suitable but inexpensive equipment for waste management.

Inadequate Personnel for Waste Management

The poor waste disposal situation in poor country cities has also been attributed to the general dearth of qualified personnel in the waste sector (Onibokun, 1999; Ogawa, 2002). According to Onibokun (1999) most municipal authorities are unable to attract suitably qualified personnel for the various aspects of waste management such as planning, operations and monitoring. Ogawa (2002) corroborates this observation when he notes that developing countries characteristically lack the technical expertise required for solid waste management planning and operation and this is usually the case at both national and local levels. He argues that many officers in charge of solid waste management have little or no technical background training in engineering or management. Without sufficiently trained personnel,

however, solid waste management projects cannot be effective and sustainable. Ogawa (2002) has observed that in many cases, solid waste management programmes initiated by external consultants have collapsed in the hands of local management due to the lack of expertise and loss of funding. Lohse (2003) has also observed that local governments in developing countries generally lack the required capacity and technical expertise to accomplish effective and sustainable waste management programmes.

Several studies in Africa and elsewhere in the developing world confirm the scarcity of qualified waste management personnel and how this results in failure to undertake effective and sustainable waste management in the cities. One example was the study carried out by researchers at the Namilyango College in Kampala (Uganda) who found that the failure of waste management programmes in Kampala and other Ugandan cities was largely the result of a lack of trained manpower and personnel to execute waste management programmes. Kironde (1999) also found that human resources for waste management in Dar-es-Salaam were very inadequate in terms of managerial and technical staff and even labourers.

The lack of qualified waste management personnel has been blamed on the lack of training and poor conditions of service in the sector. Generally, employees in the waste sector are poorly paid and have very poor conditions of service which makes many people shun jobs in the sector, including labourers (Kironde, 1999). Thus, besides the difficulty of attracting professional waste management staff, it is also difficult to attract labourers to the waste sector in spite of the high levels of unemployment in poor country cities (Onibokun, 1999; Kironde, 1999). The unwillingness of people to work in the waste sector has also been attributed to meager wages for the cleansing staff in spite of the tedious work they do. Kironde (1999), for instance, cites examples from Tanzania where wages for waste workers are very low even though they work for long hours. Majira (cited in Kironde, 1999:160-161) reports that in

July1995, waste workers in Dar-es-Salaam, went on strike to protest against poor working conditions including the lack of protective gear and the fact that they were all casual workers even after a year of being employed, and therefore had no other benefits apart from receiving their low daily wages. In Kampala, waste labourers are also said to work under very dehumanizing conditions, sometimes loading waste trucks with bare hands or using polythene bags as gloves (Namilyango College study, 2001). In Asian cities, Hanrahan et al., (2006) have reported the general lack of institutional and managerial capacities for urban environmental management among municipal governments. Many other examples exist of the poor working conditions in the waste sector in developing countries and how this affects the ability of municipal authorities to attract qualified staff and labourers alike. The general shortage of staff in the waste management sector of developing countries is also connected with the low esteem accorded waste management personnel (Onibokun, 1999).

In most cultures, there is a negative public perception regarding work which involves the handling of filth (Hanrahan et al., 2006), a situation which may be influenced by the practice in many developing countries where households without toilet facilities dispose of human excreta together with household solid waste (Songsore and McGranahan, 1996; Hardoy et al., 2001). This situation leads to disrespect for waste and sanitation work and in turn induces low morale among waste labourers (Ogawa, 2002). The lack of public appreciation and respect for waste management jobs makes many people, even the poorly-educated and unemployed, reluctant to take up employment as waste labourers. It therefore seems that poor country cities will continue to struggle with the implementation of their waste management programmes unless they train and motivate staff for the sector.

Technological Constraints

The technologies employed in municipal solid waste management in most developing countries are also said to be inappropriate and inadequate. Zurbrugg (2002) has observed that adoption of the conventional waste collection vehicles used in rich countries constrain solid waste management operations in developing countries. Apart from the high acquisition and maintenance costs involved, developing countries actually lack the engineering capacity to support the operation and maintenance of such sophisticated equipment like compactors and skip lifts. Yet, this is the equipment usually employed by municipal authorities and private sector waste contractors in many poor countries (Armah, 1993; Achankeng, 2003). Besides, the high cost of new equipment compels many poor country municipal governments to import used equipment from western countries. Such vehicles arrive already near the end of their useful life and so frequently require repairs due to breakdowns. In the absence of spare parts and the required engineering skills to maintain the trucks, only a small part of the fleet usually remains in operation after a short period of their use (Achankeng, 2003).

In Tanzania, Kironde (1999:153-154) found that shortage of equipment was a major problem facing the waste disposal operations of the Dar-es-Salaam City Council. Onibokun and Kumuyi (1999) have also noted of Ibadan and other Nigerian cities that equipment for waste management are unavailable in the desired quantities and the existing ones are difficult to maintain due to lack of expertise and funds to purchase the needed spare parts. At the time of their study in 1999, only about one-third of the pieces of equipment for the Ibadan waste management office were in working order. In Uganda, the waste management department in the capital city, Kampala, was said to lack basic equipment like trucks for waste collection and equipment for maintenance of disposal sites (Namilyango College, 2001).

Institutional Constraints

Inefficient institutional arrangements adversely affect urban management in poor countries generally and environmental service delivery in particular (UN-Habitat, 1989; Ogawa, 2002; Zurbrugg, 2002). According to UN-Habitat (1989), it is characteristic of developing countries to have several agencies involved in the delivery of solid waste and other municipal services. Furthermore, Ogawa (2002) has observed that there are often no clear roles or functions of the various agencies involved in urban environmental management. At the same time, no single agency is usually designated to coordinate the activities of waste sector agencies (Armah, 1993; Attahi, 1999).

Ogawa (2002) has, therefore, observed that the lack of coordination among the relevant urban sector agencies often results in different agencies duplicating one function. In the case of externally supported solid waste management projects, it is common for different agencies within the same country or city to act as counterparts of external support agencies for different waste management projects without any collaboration of efforts (Ogawa, 2002). Institutional inefficiencies of this nature can lead to duplication of functions, gaps in service delivery and waste of already scarce resources, or even the collapse of solid waste management programmes (UN-Habitat, 1989).

Zurbrugg (2002) has also noted deficient management capacities of institutions involved in urban environmental management in poor country cities. Solving the waste problem in poor cities will, therefore, require improvements in the institutional arrangements and capacity building for waste management and other aspects of the urban environment. Ogawa (2002) has suggested that in large metropolitan areas where there is more than one local government, coordination among the different local governments and among agencies in urban

management is critical to achieving the most cost effective alternatives for solid waste management for the entire city.

Lack of Legislation and Enforcement

The lack of legislation on solid waste management has also been cited as being partially responsible for the undefined roles of agencies in the waste sector as well as the lack of coordination among them. In the report of their African Development Bank (ADB) sponsored literature-based study of solid waste management options for Africa, Palczynski and Scotia (2002:4) noted that "no country [in the study] has specific waste management legislation even though legislation is being drafted now in some countries".

Ogawa (2002) has also observed that legislation related to solid waste management in developing countries is usually fragmented and several acts (such as public health, local government and environmental protection acts) include clauses relating to solid waste management. A case in point is that of Dar-es-Salaam which reportedly has 58 pieces of legislation dealing in one way or the other with the environment including solid waste (Onibokun, 1999:6). Such rules and regulations are, therefore, to be enforced by different agencies with duplication of responsibilities and gaps in the regulatory provisions which constrain the development of effective solid waste management systems. Furthermore, some of the laws are completely out of date and therefore of little use. The lack of adequate legislation makes it difficult to assign clear mandates to urban sector institutions connected with waste management, a situation which greatly constrains the waste sector.

Besides the scarcity of legislation on waste management, Onibokun (1999:8) has also noted the inability or unwillingness of municipal officials to enforce existing laws on environmental sanitation including the scanty legislation on waste disposal. This situation is particularly grave in the major cities where there is a general lack of public compliance with waste

disposal laws (Ogawa, 2002) if they exist at all. The non-enforcement of waste disposal laws engenders lack of fear of the law among the public and encourages negative waste handling practices such as littering and dumping of waste in drains and at roadsides. Such practices worsen the waste disposal situation and increase the burdensome tasks of waste collection, transportation and disposal for the resource-constrained municipal authorities. Thus, inadequate legislation and non-enforcement of waste disposal laws greatly constrain efforts to address the solid waste problem that currently confronts developing country cities.

Lack of Good Governance and Civil Society

The low status of environmental services in poor country cities has also been blamed on the lack of good governance which promotes the well-being of the people, and on the lack of civil society action to exert pressure on governments to live up to their social responsibilities (Devas, 1999; Kwawe, 1995; Hashmi, 2007). Due to 'bad governance', municipal governments in poor countries show little regard for the wellbeing of the citizens and so renege on their responsibility to provide basic infrastructure and services to keep the cities clean, healthy and safe (Hashmi, 2007). Commonly, autocratic styles of administration by supposedly democratic regimes alienate public opinion and participation in urban management (Devas, and Korboe, 2000; Hashmi, 2007), a situation which does not augur well for effective waste management. From a governance point of view, the fact that the ordinary residents of cities, especially the poor, are denied participation in decision-making about issues that affect them means that their concerns may never be taken on board and their needs for such services as water, sanitation and waste disposal are therefore unlikely to be met (Devas, 1999; Devas and Korboe, 2000)

Political Neglect

While the various factors discussed above are important contributors to the poor solid waste management in poor country cities, some researchers find political neglect to be the root cause of the waste problem in poor country cities. Both national and municipal governments in poor countries seem to lack the political will to manage the rapidly growing cities and to provide infrastructure and services for environmental maintenance. Several studies point this out including Onibokun and Kumuyi (1999:82) who have noted the fact that "most local governments in Nigeria do not accord high priority to waste management".

In Dakar, Senegal, Ka-Mbaya et al (2006) also found a steady decline in urban environmental quality as the government had completely ignored the issue of waste management. According to Ka-Mbaya et al. (2006) the central government as well as the various municipal councils in Senegal had "relegated the issue of solid waste to the background" as though it was not important. According to Ka-Mbaya et al. (2006) proposed solution to the worsening solid waste situation in Senegalese cities was, therefore, for the country's political leadership to appreciate the importance of environmental sanitation and proper waste disposal and to commit them to addressing these problems. It is therefore evident that the governments of many poor countries do not care much about environmental sanitation which is the root cause of the worsening waste disposal situation in their cities. The lukewarm attitude towards environmental sanitation is shown in the failure of these governments to formulate legislation, create capacities and provide resources for urban environmental maintenance.

As a typical developing country, Ghana also has serious waste management problem in all its major cities. Urban settlements in the country are characterised with worsening waste disposal situations which the authorities seem unable to deal with. A case in point is the

Ablekuma Central Sub-Metropolitan Assembly where environmental and sanitation and proper disposal are the major problems.

2.12 Definition of Public- Private -Partnership (PPP)

Public-Private Partnership (PPP) is a system in which a service or a project is funded and operated through a partnership of government and one or more private sector organizations e.g. solid waste collection. (Awortwi, 2004). Public private partnership is a long or medium term arrangement between the public and private sectors whereby public sector transfers part of its responsibilities to the private sector (World Bank, 2011).

2.12.1 Types of Private Sector Participation

Private sector participation involves reducing government control, ownership and/or activity within a service, such as solid waste collection and disposal, traditionally provided by government.

2.12.2 Reduced Government Control

Government control is decentralized by commercialization. Commercialization can take many forms. Government agencies for solid waste management are restructured into semi- or quasi-private enterprises with some degree of government oversight, but with the management freedom to operate at optimum efficiency and generate revenues exclusively for their own use. In the case of such enterprises, the assets are typically owned by the enterprise and government is a shareholder of the enterprise. This may not be exactly private sector participation, but seeks to graft many of the strengths of private companies onto a decentralized government organization. Various forms of commercialization include: private corporations, public corporations, semi-private corporations, and public authorities. Commercialization reduces government control over decision making. If the public organization has been fully commercialized, the only government ownership may be the

shares and the only influence may be the Board appointments. Each commercialization option is slightly different in its level of autonomy. Commercialization involves changing the financial arrangements of the solid waste organization, including creation of segregated accounts and separate revenue streams. As part of the commercialization process, the public solid waste organization is typically changed in its organizational structure so that has more autonomy and accountability.

2.12.4 Divestiture

Government-owned enterprises and their related assets are partially or wholly sold to the private sector, with the expectation that the basic function of the enterprise would continue.

2.12.5 Public-Private Partnership

Government establishes a joint venture with the private sector to which each party contributes assets and resources, and each party assumes certain risks and responsibilities as defined in contractual agreements. While this term is sometimes used broadly to mean all public/private arrangements, it is a legally defined term in some countries (such as Indonesia), signifying a joint venture.

2.12.6 Reduced Government Activity

Private sector participation is also a means of reducing government activity. Government activity is reduced when the private sector participates in service delivery through contracts, franchises, concessions, and open competition (or private subscription).

2.12.7 Contracting

Government awards a finite-term service contract to a private firm to provide solid waste services, and government pays the firm for the services delivered. Alternatively, government

awards a management contract to a private firm to provide management oversight of others who are providing solid waste services.

2.12.8 Franchise

Government grants a private firm an exclusive monopoly to provide a specific type of solid waste service within a specific zone. The firm collects its own revenues from generators within the zone or from the sale of solid waste by-products removed from the zone.

2.12.9 Concession

As with the concept of logging, mining or water concessions, government allows the private sector to utilize one of its resources, in this case solid waste, for profit-making purposes. Concessions typically involve construction of major long-term facilities to sort, treat, transfer, or dispose of solid waste. Government may pay a tipping fee or service charge to defray part of the costs of processing the solid waste, but sale of the concession's product (such as compost), or service fees paid by non-government customers typically cover the remaining costs. Government provides a guarantee of flow control, so that amounts of wastes received closely match facility design capacity. Most concessions are operated on a "take or pay" basis, where tipping fees are paid even if the guaranteed daily quantity of waste is not provided.

2.13 Benefits of Public-Private Partnership

Due to increasing problem of municipal solid waste management in most cities in the developing countries, private sector participation in providing solid waste services started as a response to major failures of service delivery by the public sector (UNESCAP, 2011). It is often believed and proposed that private sector participation in providing municipal services could be the best possible way to solve the current waste problems in developing countries and in particular public private partnership is seen as a potential

alternative to the traditional service delivery system fully controlled by the public sector, more importantly public private partnership is believed to provide the services that the public sector neither have the resources nor the expertise to supply alone (Forsyth 2005:430). Some benefits of Public private partnership are summarized below:

- Speedy, efficient and cost effective delivery of projects;
- Creation of added value through synergies between public authorities and private sector companies, in particular, through the integration and cross transfer of public and private sector skills, knowledge and expertise;
- Competition and greater construction capacity;
- Innovation and diversity in the provision of public services;
- Effective utilisation of state assets to the benefit of all users of public services;
- Alleviation of capacity constraints and bottlenecks in the economy through higher productivity of labour and capital resources in the delivery of projects;
- Accountability for the provision and delivery of quality public services through performance of incentive management (UNDP, 2005).

2.14 The Concept of Private Sector Participation (Privatisation) in Service Delivery

According to Osborne (2000), the 1990s have seen the establishment of public private partnerships (PPPs) as a key mechanism of public policy across the world. However, UN Habitat (2000) points that, the term ‘’privatisation’’ has a “conceptual confusion or ambivalence” with regard to private sector involvement in municipal service delivery. Some local authorities understand it as ‘contracting or leasing out’ tasks and responsibilities to private sector firms while the Local government retains overall supervisory and regulatory

control. Others understand it as 'commercialisation' of services by municipal departments and yet some understand it as total and complete 'transfer' of responsibilities for providing the service to private sector firms who set their own prices.

Jaglin (2002:232) mentions that, commercialisation is a form of privatisation involving the transformation of a public body into a private company with public capital. Jaglin (2002:233) further mentions that, commercialisation denotes operation of enterprises on business-like principles to achieve efficiency and profitability. According to Lee (1997:10), in contracting out, government enters into contractual agreements with private operators to provide goods and services or to manage certain government activities; while in transfer, government assets are sold or transferred to private owners.

However, privatisation according to Cointreau-Levine (1994:1) is ''a reduction in government activity or ownership within a given service or industry''. Cointreau-Levine (1994:3) identifies the most common types of private sector participation in SWM as; contracting, concession, franchise and open competition.

Cointreau-Levine (1994:4) further argues that, private sector participation is a possible opportunity but not a panacea. Lee (1997:12) mentions that, among the main modes of privatisation, contracting is considered viable, provided that, among other conditions, it is possible to adequately specify the outputs anticipated from the contract. Post, Broekema & Obirih-Opareh (2003) in agreement with Lee (1997:11) mention that, contracting is preferred in solid waste collection in developing countries due to its greatest potential in lowering solid waste collection costs. Post, Broekema & Obirih-Opareh (2003) however point that this form of privatisation is preferable in situations where contract periods are not too short

and tendering procedures and contract specifications stimulate competition. However, Huysman et al (2004) differ with Cointreau-Levine (1994) since they argue that, privatisation does not only or always imply a reduction of government's role or ownership but mainly transformation towards strengthening and expansion of regulatory and monitoring responsibilities of public authorities, where the private sector assumes service provision role while the government performs a coordination and facilitation task. Several authors consider privatisation as a necessary vehicle in service delivery. Cointreau-Levine (2000) argues that, privatisation brings in private sector investment and improves operational efficiency.

The above argument is supported by Coad (2005) who points that, the private sector is more efficient, effective, increases coverage, has expertise and improves standards, reduces public sector administrative and operational duties, improves decision making and has access tocapital. Klundert & Lardinois (1995) in agreement with the above scholars argue that, the private sector has faster response, higher service ethics and greater flexibility than the public sector. Klundert & Lardinois (1995) however point that the success of the above benefits arises from a mixture of public and private involvement, not private sector acting alone. Cointreau-Levine (1994) mentions that, efficiency gains can be realised from smaller, more efficient public sectors and a more dynamic private sector. Cointreau-Levine (1994) further mentions that, monitoring capability of local authorities is a pre-requisite to assure efficiency gains by privatisation. According to Lee (1997), one principal source of enthusiasm for privatisation comes from the promise of substantial cost savings. In Malaysia, a study of privatised waste collection services revealed that of a total of 17 Municipalities, 9 enjoyed some cost saving after privatisation (Sinha 1993). According to Mehta and Mehta (1994), the cost savings resulting from contracting out were

found to range from 15 to 70 percent for a variety of municipal services in the city of Rajkot in Western India. In Jakarta, after refuse collection and transport services in 10 percent of the city's 261 sub districts were contracted out in 1988, one study found that the city had saved US$100,000 in that year (Walker et al. 1992).

However, Warner (2008) on the contrary mentions that a 2002 survey in the United States found that, previously contracted work was brought back in house due to problems with service quality, lack of cost savings, internal process improvement and citizen support. Warner (2008) further mentions that a similar survey in Canada in the following year found exactly the same rank order of reasons for reverse privatisation. Schubeler, Wehrle & Christen (1996) however argue that, much as the profit orientation can drive the private sector under appropriate conditions to provide SWM services more effectively and at lower costs as compared to the public sector, its involvement does not guarantee effectiveness and low costs.

According to Awortwi (2004), a study on private sector involvement in solid waste service provision in Ghana found almost no gains from the public-private arrangement. Contrary to the ''efficient argument'' by the above scholars, Lee (1997) argues that, a review of the privatisation experiences of a small number of Asian countries reveals that, the mobilisation of private investment is the dominant motivation for privatisation. Lee (1997) however admits that, the efficiency argument of the private sector in solid waste collection has been validated by some of the empirical evidence collected from several Asian countries. In Kuala Lumpur, private firms made more trips per day for each vehicle and collected more waste on each trip than public departments (Lee 1997).

In Seoul, the private sector showed a markedly higher level of labour efficiency and vehicle efficiency in waste collection and transport (Kim 1991). In Malaysia, the results of a study of privatised rubbish collection services in 17 Municipalities showed that the level of collection was better with privatised services in 11 out of the 17 Municipalities (Sinha 1993).

A review of privatisation in other services also reveals criticisms from other scholars. According to Kirkpatrick, Parker & Zhang (2004), a study covering 110 African water utilities, including 14 private, found no significant difference between public and private operators in terms of cost. In a related study, Ndandiko (2006) reports that, a survey of 18 cities in Asia (including Manila and Jakarta), conducted by the Asian Development Bank (ADB) in 2004, established that private sector operators in the water sector, were performing significantly worse than most public sector operators on three indicators of coverage, investment, and leakage. The above arguments are further supported by Moreira & Seroa da Motta (2004) who point that, a study of about 4000 sanitation operations in Brazil found no significant difference between public and private operators in terms of the total variation in productivity. In Senegal, Nordtveit (2005) found that privatisation provided low quality service in education because the private partners wanted to make money and therefore cut costs.

Warner (2008) who concluded a research on "Reversing privatisation, rebalancing government reform: marketing, deliberation and planning'' points that, privatisation (contracting out) of local government services which sky rocketed during the last decades of the 20th century failed to deliver adequately as regards efficiency, equity or voice criteria and this has resulted in to reversals in this trend especially in United Kingdom (UK) and Australia where compulsory competitive tendering has been abolished; while in New

Zealand, the focus is on rebuilding of service delivery capacity of the internal government. Also in the United States (US), reverse privatisation trend is witnessed. Here, previously contracted services are being brought back by the local government. The implication of this reverse trend is aimed at structuring the market in a bid to enhance competition and reduce transaction costs of contracting.

2.15 Private Sector Solid Waste Management Experiences in Africa

The shift towards privatisation of solid waste service delivery worked out in various forms in different countries in Africa. In Accra, Ghana, for instance, Post, Broekema & Obirih-Opareh (2003) mention that the privatisation reform that was on the political agenda since the early 1990s did not progress well. They mention various reasons such as; anti-private sector mood among the successive regimes which marginalised strong and vibrant private sector development, fear of offending and arousing strong populist and nationalist sentiments and worker protest respectively, uncertain political environment and fallacies of local administration. As a result, solid waste collection was far from adequate since the city's Waste Management Department (WMD) was only able to collect approximately 60 percent of the total waste generated while the remaining 40 percent lay as mountains of uncollected garbage on the streets. When the collection services were privatised on a franchised basis to City and Country Waste (CCW), a joint Canadian-Ghanaian company, in 1999, the solid waste collection situation improved considerably. CCW was able to provide regular waste collection services (twice a day) to poor and high density populated areas and also managed to collect more than 95 percent of the user fees.

On the other hand, Jomit (2009) observes that privatisation of solid waste services in Dar-es-Salaam, Tanzania took a completely different shape because the motivation to privatise solid

waste collection services was propelled by the poor impression of the country. He argues that the mode of privatisation was unique in Dar-es-Salaam. Rather than foreign investors (companies), it was the local CBOs who were facilitated to provide waste collection services to the households. This kind of privatisation according to Jomit (2009) is noteworthy because it is built upon already existing structures and turned out to be a success because of the noticeable cleanliness of the city and the generated employment opportunities for the residents. In contrast, Jomit (2009) mentions that, in Kenya, Jacorossi International, an Italian company was contracted to take over SWM services amidst wide spread protests. Hence the fear of job losses forced workers to the streets. In Nigeria, due to complaints of clandestine dumping by private contractors and desire to ease the commercialisation of its own operations, the Lagos State Waste Disposal Board (LSWDB) in 1991, revoked the license of private refuse haulers and declared its monopoly over service delivery (Cointreau-Levine 1994).

Privatisation of SWM can also have adverse effects on the economy since it, according to some authors threatens the sustainability of the informal sector involved in recovery, re-use and recycling of waste materials. Fahmi (2005) and Jomit (2009) mention that, in Cairo, Egypt, the Zabaleen, the traditional waste collectors, had created one of the world's most efficient resource recovery and waste recovery systems. Before the end of the Century, one third of Cairo's waste of approximately 3000 tonnes was handled by them. In addition, 85 percent of this waste was recycled through their self-owned and operated enterprises. Unfortunately, the sustainability of this intricate relationship between the Zabaleen community, the environment and their livelihood is jeopardised by privatisation of solid waste services through contracts with technology-intensive multinational corporations. This approach according to Fahmi (2005) threatens the sustainability of the garbage communities, the Zabaleen, by removing access to their chief economic asset, waste. He argues that, the

situation is further exacerbated by an official policy of moving Zabaleen activities out of the city in a bid to transforming their neighbourhoods into cleaner and livable environments. This transfer would increase their travelling distances and costs of their services, thus creating new risks for the sustainability of their livelihoods. According to Jomit (2009), the number of job losses from this policy is estimated to be at 75,000. In Central Africa, Jomit (2009) points that the low level of industrialisation, particularly of the recycling sector provides little opportunities for informal waste activities.

2.16 Public Service Delivery and Decentralisation in Ghana

Adarkwa (2005), point out two variant forms of decentralisation are currently being implemented in Ghana. First, there is the devolution of major political and administrative responsibilities from Central Government to Assemblies for local governance and general development. Devolution in Ghana has to do with restructuring technical set-up, political and administrative institutions and mandates to deliver services particularly at the local level. The delivery of solid waste management services has been decentralised and is now the mandate of the local government. The decision making on public or private delivery and the enforcement of regulation are the responsibility of the local governments (Assemblies cited in Oduro-Kwarteng 2011).

The other which operates alongside the first, is the process of administrative and technical deconcentration of the planning and delivery or provision of specific services such as water and sanitation, health, education, and agriculture from Ministries, Departments and Agencies (MDAs). Most of the government agencies fall under this category, and an example is community water and sanitation agency and all the commissions. The deconcentration involved the re-arrangement of the location of key personnel and where their functions are performed. Obiri-Yeboah et al. (2004) argue that the decentralisation effort in Ghana to strengthening

the MMDAs and creating Sub-Metropolitan Assemblies within the Metropolitan Assemblies has performed far below expectation due to impediments associated with the decentralisation. Obiri- Yeboah et al. (2004) distinguished two factors which explain the flaws of the reform. The first refers to the failure of the decentralisation policy (on devolution) to empower the people through the Assemblies, to restructure the government machinery and reform local governments to take responsibility for local administration and development and to make public administration more efficient and responsive to local needs. The bottom-up approach to user involvement in local service delivery is an issue affecting local development, especially solid waste management and sanitation services which are core responsibility of the local governments. The second refers to the lack of restructuring of the allocation of resources and reassignment of functions and responsibilities to the three levels of government (national, regional and district). There is insufficient transfer of resources from the central government to the Assemblies in order to match the transfer of responsibilities. For example, the WMDs do not have financial autonomy and continue to depend on the highly politicised local authorities. The weakness of resource allocation is because of the administrative and technical deconcentration of the planning and provision of specific services. A lack of financial independence (solid waste collection is funded partly by central government resources) and the fact that there is still no composite budget for the Assemblies compound these problems.

Though decentralisation has brought major institutional changes such as making the district assemblies the pivot and focal point of planning and development, the administration of the Assemblies in Ghana continues to be weak since the central government ministries, departments and agencies (MDAs) continue to exercise tremendous authority and make spending decisions in a highly centralised and deconcentrated fashion. The local

governments have little authority to make strategic decisions on infrastructure services. They have methods of raising the tax revenues but revenue generation has always been problematic due to corruption, politics, and lack of capacity.

The reduction in central transfers and the deepening financial crises at local level compelled central governments to surrender to pressures to set up central grant systems (Assemblies 'Common Fund'). Obiri-Yeboah et al. (2004) point to gaps between formal rules and actual practices in private sector involvement due to inadequate fiscal transfers from the central government to decentralised local governments to match increased responsibilities. There were problems such as: weak internal revenue mobilisation capabilities of the local governments, the lack of effective urban governance and its effects on service provision, and inadequate attention to environmental concerns in the development programmes. There is the tendency of the central government to interfere in purely local matters despite the decentralisation policy. The Local Governments with the requisite capacity will be able to manage agents to benefit from the presumed advantages of contracting out service delivery. The Local Government capacity requirements include: developing legal framework in which other actors operate; creating a competitive contract award process; developing realistic financial incentives for agents; setting effective monitoring and compliance system; and improving organizational and management skills (Awortwi, 2003).

The use of markets and contracts within the context of decentralization of service delivery is an emerging process in developing countries and is not yet fully understood. The power relations in the decentralization processes and the new role of the local governments to use market mechanisms (contracting-out) are least explored in developing countries.

2.17 Some Strategies of Waste Management used by Zoomlion Ghana

Every organisation has strategies they use in achieving their goals .When Zoomlion Ghana joined in the management of waste in Ghana they employed the following strategies:

2.17.1The Tricycle Concept

The tricycle waste collector concept ensures an effective and efficient collection of waste from our communities, especially in those high density but low income communities where the large and heavy waste collection trucks cannot even access. The technology is simple and operates on manual power which is cheaper when compared to motorized ones.

The tricycle waste collector concept was developed to help developing economies which cannot afford the initial heavy investment required for the acquisition of heavy duty waste management vehicles. The tricycles come with a container at the rear and can be used effectively in collecting refuse from inaccessible residential areas and discharged into bigger containers. These large containers are currently placed at various locations, referred to as Transfer stations or sanitary sites to be picked up by the container lifting truck.

The introduction of this concept into the country is informed by the high capital outlay involved in acquiring new and replacing old vehicles and managing the problems associated with payment for waste collection, traffic delays and easy access to our communities.

This concept creates employment opportunities for the youth and therefore reducing poverty, very low operation and maintenance cost, regular and maximum evacuation of waste, minimization of indiscriminate disposal of waste in drains and open spaces reducing the incidence of flies and mosquito breeding thus ultimately resulting in less disease –causing conditions in the low income communities in particular.

2.17.2 Training School

The training school is planned to train personnel to feed the industry with trained personnel for services delivery and management and the repair and maintenance of the requisite operational vehicles, plant and equipment.

The company will not restrict itself to in-service training of its own personnel, but also training of personnel of existing waste companies and individuals who wish to find their future in the waste management sector.

The company has taken up this mantle after a full realization that one of the constraints facing the waste management industry is the lack of personnel and facilities for providing the market for professional training in this important sector of the economy.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter focuses on the activities of Zoomlion Ghana, profile of the study area, research design, population, sample and sampling technique, data collection instruments, reliability and validity of data, and analysis of data.

3.1 Activities of Zoomlion Ghana

Zoomlion Ghana is one of the private waste management organizations which was established in 2006 has quickly become the largest waste management company in Ghana and is quickly becoming the biggest waste management company on the continent. (available at www.zoomliongh.ltd.com.) Zoomlion operates in almost all the districts of Ghana and is also operating in a number of West African and South African countries: Nigeria, Togo, Guinea, Sierra Leone, and Angola. It is in association with Zoomlion China, manufacturers of quality and durable waste management vehicles and equipment with over 50 years' experience in the waste management sector in China.

Zoomlion Ghana has also exchanged ideas with international waste management companies like TEDCOR (PTY) Ltd, South Africa. This is a south-south arrangement for technical cooperation and capacity building and training exposure for delivering quality and affordable solutions based on technical innovations. Staff members of Zoomlion Ghana Limited have also had the opportunity of exchanging ideas with personnel from experienced waste management companies like Wasteman Pambilli also of South Africa, Nehlsen of Germany, Hubei of China, Ashock Leyland and Mahindra, truck companies in India.(available at zoomliongh.ltd.com)

Zoomlion Ghana strives to bring management and technical expertise to the competitive field of waste disposal in Ghana and Africa. They boast of an impressive fleet of modern waste disposal vehicles and pride themselves in their use of appropriate and modern technology to manage waste. Zoomlion is on the cutting edge of waste management technology in Ghana. They are currently constructing the first industrial scale mechanical waste separator and composting facility. Zoomlion focuses on excellent customer service and satisfaction, offering complete solutions for all their customers in waste management needs.

According to Zoomlion Ghana, they first seek to satisfy their clients and customers by continuously improving upon their operations to make them cost-effective.

Zoomlion Ghana is committed to building long-lasting relationships with their private sector customers, Ministries, Departments and Agencies (MDAs) of Central Government, Metropolitan, Municipal, and Districts Assemblies (MMDAs), and the communities they serve not excluding even their competitors in the industry, who they would prefer to refer to as partners in the business of keeping Ghana clean, green, healthy and salubrious. (available at www.zoomliongh.ltd.com)

The vision of Zoomlion is to develop and grow as the leading fully integrated private waste management company in this country Ghana by 2015, relying on their cooperation with their partners in the industry, our associates and joint venture partners, both national and international, now and in the future.

Their mission is to be at the forefront of the environmental sanitation services industry, by the introduction and utilization of simple but modern technologies and methods of waste management at affordable and competitive rates.

Zoomlion Ghana has in place systems and practices to revolutionize the waste management services. The strategy of the use of simple but technologically innovative solutions in services delivery will be guided by the following objectives:- the use of brand new waste management vehicles and equipment; full implementation of the "TRICYCLE CONCEPT" in waste management; Development of capacity in the fabrication and assembling f waste equipment and recycling of waste components; Provision of total waste management services, effective and efficient. (avialable at. www.zoomliongh.ltd.com)

Zoomlion Ghana has hired and continues to hire the requisite expertise and competent personnel at all levels, and the management boasts of some of the most experienced professionals in waste management. In addition, their staff members are highly motivated and well-trained to meet the growing challenges of the industry. (avialable at. www.zoomliongh.ltd.com)

Among the range of services of Zoomlion Ghana include; Tricycle Concept in public cleansing and pre-collection services; Solid Waste Collection (Door-to-Door, Communal Container. Heap Evacuation) Services; Liquid Waste (Septic Tank Emptying/Desludging) Services; Public Cleansing (Street/Pavement Sweeping and Drain Cleansing) Services; Motorised Road Sweeping and Washing Services; Operation and Maintenance (O&M) of Landfill/Final Dump Site; Pest Control Services; Landscaping, Beautification and Horticultural Services; Local Assembly and Sale of Waste Management Equipment (Tricycles and Waste Containers) Services: Hiring and Leasing of Waste Management Vehicles and Equipment Services: Agency Representation and After-Sales Services for Waste Management Vehicles and Equipment; Capacity-Building and Training Services for Waste Management personnel (Managerial/Technical/Operational)

Their target clientele are factories, transport terminal operators, companies (public/private), hotels, restaurant private premises, educational institutions (all levels), hospitals , clinics, chemical laboratories, residential estates, industrial estates and establishments, metropolitan, municipal and district assemblies, embassies (residences and offices), sports(soccer) stadia management.

3.2 Solid Waste Pre-collection Door to Door Service

A specially designed service in low-to medium income, high density communities and areas to ensure that total coverage of premises is achieved to eliminate unhygienic conditions within these communities which are prone to indiscriminate waste disposal practices: the pre-collection is supported by central containers placed at approved strategic sanitary sites to ensure 100 per cent coverage.

3.3 Street Sweeping and Drain Cleaning

The sweeping of streets and pavements and the cleaning of drains in the Central Business District (CBD), Ceremonial and strategic roads and haulage of the waste arising from sweeping and cleaning activities to temporary storage containers or to treatment and final disposal sites in the country.

3.4 Liquid Waste Collection and Haulage to Disposal Sites

The service under this consist of emptying of septic tanks of domestic water closet toilets, Public Septic Tank Latrines (STL) which are located within the administrative area of the assembly and which are crying for professional services to improve the amenity levels that patrons desire.

3.5 Fabrication and Sale of Refuse Containers

The Engineering Department of the company is also into fabrication and sale of skip containers. These include 3 cubic meters, 12 cubic meters and 23 cubic meters containers.

The company also sells plastic litter bins in the range of 60 litre bins, 120 litre bins, 240 litre bins and so on.

Zoomlion's fleet of brand new compaction trucks, workshops, vehicle replacement policy and integrated waste management system offer them the unique opportunity to provide reliable and total waste management solutions.

Zoomlion Ghana, recommend and provide waste management services that are specifically tailored to their client's needs and ensure that those solutions are delivered at best value.(avialable at. www.zoomliongh.ltd.com)

3.6 Profile of Ablekuma Central sub-Metropolitan Area

Ablekuma Central sub-Metropolitan is part of Accra Metropolitan Assembly. Accra Metropolitan Assembly has a total land size of 200 square kilometres and is made up of eleven sub metropolitans namely Ablekuma Central, Ablekuma North, Ablekuma South, Ashiedu Keteke, Ayawaso Central, Ayawaso East, Ayawaso West- Wuogon,La, Okaikoi North, Okaikoi South, and Osu Klottey. The Southern boundary of the Metropolis of Accra is the Gulf of Guinea spanning Gbegbegese to the Mukwe Lagoon near Regional Maritime Academy. The boundary continues along the Maritime Road to join the Accra-Tema road to Nungua Police Station Barrier.

Ablekuma Central sub-Metropolitan District Council was established by Legislative instrument 1722. The administrative set up of this sub-Metropolitan District Council is made

of the General Administration, Treasury Department, Waste Management Department, Metropolitan Works Department, Metropolitan Public Health Department, Metropolitan Security Unit, Internal Audit Unit, NADMO, Roads Unit, Rating Unit. It is also headed by a Chairman who is the political head and an Assistant Director who is the head of the Administration. It consists of five (5) electoral areas, namely, Abossey Okai, Mataheko, Gbortsui, Laterbiokoshie and Nnenmeete.

Economic facet of employment at Ablekuma Central provides 33 per cent jobs to the public and private formal sectors, 62 per cent of the people in the Ablekuma Central sub-Metropolitan District area wok in the informal sector. The remaining 5 per cent work with non -governmental and international organizations.

The percentage distribution of religious groups shows the predominance of Christians (85.17 per cent) in the sub-Metropolitan, compared with the second major religion, Islam (9.33 per cent).

The National Population and Housing Census conducted in 2000 projected the population and housing characteristics with an estimated of 594,012 in 2009. Regarding characteristics, Ablekuma Central Sub Metropolitan District Council is one of the eleven sub- Metropolitan District Councils of Accra Metropolitan Assembly (AMA). It shares boundaries with Ablekuma North sub metropolitan.

Ablekuma Central sub-Metropolitan area was selected for the study because it is densely populated and they are prone to generating more waste. Again the researcher has worked in the area and really knows the sanitation condition there.

3.7 Research Design

Every research must have its theoretical underpinnings and philosophical assumptions. Methodology has been acknowledged as the strategy or design which underpins the choice of methods, linking the desired outcome of the study with such chosen method (Crotty 1998). Constructionist (or subjectivist) epistemology is usually seen as claiming that there is no objective truth and that there is no meaning without a mind to attribute meaning to it. On the contrary, research methodologies and methods derived from positivist theory tend to be categorised as quantitative and as being concerned with gathering 'facts' and translating these data into numerical form (Blaxter et al., 2001).

When considering the choice between qualitative or quantitative research, Silverman (2010) suggests that qualitative is more interesting than numbers. Presumably then, Silverman sees qualitative research as being "more interesting" because he acknowledges the subjectivists' perspective, which would seek knowledge from people's experience, opinions and views. Miles and Huberman (1994:1) highlight the appropriateness of qualitative research to social work by stating that 'good qualitative data are more likely to lead to serendipitous findings and to new integrations'. They argue that words 'have a concrete, vivid, meaningful flavour that often proves far more convincing to a reader than pages of summarized numbers'.

Padgett (1998:2) agrees by stating that 'qualitative methods are inductive; they seek to discover, not test, explanatory theories'. She further states 'qualitative studies seek to convey the complex worlds of respondents in an holistic manner using "thick descriptions" rather than particularistic categories and variables'.Bryman(2001:23) agrees that qualitative research as a research strategy is inductive, constructionist and interpretive. Interpretive research, which is where qualitative research is most often located, assumes that reality is socially constructed, that is, there is no single, observable reality. This allows for the greater

involvement of the researcher in collecting and analysing of data. Quantitative researchers have attacked qualitative research on many fronts which Bryman (2008:391) highlights among others 'as being too impressionistic and subjective'. However, for qualitative researchers, this criticism is also the source of their strength. Although it has been claimed by Winter (2000) that quantitative researchers attempt to disassociate themselves as much as possible from the research process, qualitative researchers have come to embrace their involvement and role within the research.

Patton (2001) supports the notion of researcher's involvement and immersion into the research by discussing that the real world are subject to change and therefore, a qualitative researcher should be present during the changes to record an event after and before the change occurs. Considering the above views, my study employs the use of qualitative methods which allow the acquisition of knowledge through interaction, interviews and observation because these are vital when understanding and analyzing people's actions, meanings and situations in specific contexts.

An evaluative case study method research design was used for the study. According to Merriam (2001) an evaluative case study involves description; explanation and judgement. Guba Lincoln (1981) concludes that case study is the best reporting form for evaluation. They are of the view that case study is best because it provides thick description, is grounded, is holistic and lifelike. It simplifies data to be considered by the reader, illuminates meaning and can communicate tacit knowledge. Kenny and Grotelueschen (1980) also offer several reasons for choosing a case study design when doing an evaluation. They argue that a case study is appropriate when the objective of an evaluation is to develop a better understanding of the dynamics of a programme.

3.8 Population

The target group for this study were the residents, officials of Ablekuma Central sub-Metropolitan area, officials and fieldworkers of Zoomlion Ghana.

3.9 Sample and Sampling Technique

A total of 91 respondents were used for the study. This included some key informants of the Waste Management Department of Ablekuma Central sub- Metropolitan area; officers of Zoomlion Ghana. Two (2) officials were selected from the Waste Management Department of Ablekuma Central sub-Metropolitan area, the officials directly have oversight responsibility of supervision of the activities of the private waste service provider in the study area and also they have worked in the waste management department for over five years. Purposive sampling technique was used for the officials of AMA Waste Management Department in other to get the necessary information, adequate knowledge and experience on solid waste management in the study area. This technique helped the researcher to select the respondents who provided the needed information for the study.

This technique was used based on the assertion of Matthews and Ross (2010:167) who state that purposive sampling is 'generally associated with small, in-depth studies with research designs that are based on the gathering of qualitative data and focused on the exploration and interpretation of experiences and perceptions'. Engel and Schutt (2010:96) also added that 'in purposive sampling each sample element is selected for a purpose, usually because if the unique position of the sample element'. The National Population and Housing Census conducted in 2000 projected the population and housing characteristics in Ablekuma Central sub- Metropolitan area, with an estimation of 594,012 in 2009. When selecting respondents from the community convenient sampling technique was also used because of their large

number and time available for the research. Sixty (60) residents were selected, 12 from each of the five electoral areas. This technique ensured an unbiased sampled population. Purposive sampling technique was used to select four (4) officers at the Zonal office of Zoomlion Ghana at Ablekuma Central sub metro. They were selected because they are the local heads in the Zonal office and therefore were to be a great source of information regarding the solid waste management situation in the area. Cluster sampling technique was used to select the fieldworkers. Five (5) fieldworkers were selected from each of the electoral areas within the sub metropolitan area. According Zonal Coordinator of Zoomlion Ghana in each of the electoral areas there were more than twenty five fieldworkers responsible for managing waste. Table 3.1 below gives the selected fieldworkers in the five electoral areas.

Table 3.1: Selection of fieldworkers (Cluster sampling)

Electoral area	**Number of fieldworkers**
Abossey Okai	5
Mataheko	5
Gbortsui	5
Laterbiokoshie	5
Nnenmeete.	5
Total	**25**

Source: Fieldwork, 2012

3.10 Data Collection

3.10.1 Data Collection Instrument

Three instruments were employed for the data collection in this research study: in-depth interview, interview scheduled and focus group discussion.

The in-depth interviewing method involves interviews based on open ended questions with the intention of collecting as much information from the respondents. The main advantage of using open ended questions in interview is that the respondents are free to say whatever they

feel like saying in their own words (Collins, 1970:3). The research questions required collection of as much as information from the stakeholders so the in- depth interviewing method was also for data collection from the selected fieldworkers. This technique allowed the researcher to have great control during the interview and also to assess the validity of the information provided.

Interview scheduled and Focus group discussion was used for the residents. Morgan & Kreuger (1993) states that focus groups are particularly useful when there are power differences between the participants and decision-makers or professionals, when the everyday use of language and culture of particular groups is of interest, and when one wants to explore the degree of consensus on a given topic. Powell et al. (1996: 499), define a focus group as a group of individuals selected and assembled by researchers to discuss and comment on, from personal experience, the topic that is the subject of the research.

I conveniently selected 12 residents from each of the five electoral areas to participation in the interview scheduled and the Focus Group Discussions. Five focus groups were formed for the discussions. The groups were homogeneous. Morgan (1988) states that: ‘‘it is not always easy to identify the most appropriate participants for a focus group. If a group is too heterogeneous, whether in terms of gender or class, or in terms of professional and ‘lay’ perspectives, the differences between participants can make a considerable impact on their contributions. Alternatively, if a group is homogenous with regard to specific characteristics, diverse opinions and experiences may not be revealed. Participants need to feel comfortable with each other. Meeting with others whom they think of as possessing similar characteristics or levels of understanding about a

given topic, will be more appealing than meeting with those who are perceived to be different''

3.10.2 Data Collection Procedure

Interview scheduled and focus group discussions were used for the residents while in- depth interviewing method used to collect data from the official of Zoomlion and the Waste Management Unit of Ablekuma Central sub- metropolitan office. This took three weeks. The researcher was assisted by two assistants.

3.11 Data Analysis

The data gathered from various sources were processed and analysed. Simple descriptive statistical and analytical tools such as frequencies, percentages, were employed in the analysis of the data. Meaningful patterns relating to the research questions were identified and interpreted.

3.12 Reliability and Validity

3.12.1 Reliability

Polit and Hungler (1993:445) refer to reliability as the degree of consistency with which an instrument measures the attribute it is designed to measure. Reliability relates to the consistency of the data collected (Wallen &Fraenkel, 2001).

Pre-test of the research instruments were carried out in Mataheko one of the electoral areas in the study area order to eliminate vague, leading and ambiguous questions. This was done to ensure that, high quality data collection instruments were used during the field work period.

The questions which were answered by the respondents revealed consistency in their responses.

3.12.2 Validity

According to Polit and Hungler (1993:448) the validity of an instrument is the degree to which an instrument measures what it intend to measure. An instrument is valid if it measures what it is intended to measure and accurately achieves the purpose for which it was designed (Patten, 2004; Wallen &Fraenkel, 2001).

Patten (2004) emphasizes that validity is a matter of degree and discussion should focus on how valid a test is, not whether it is valid or not. According to Patten (2004), no test instrument is perfectly valid. The researcher needs some kind of assurance that the instrument being used will result in accurate conclusions (Wallen & Fraenkel, 2001). Validity involves the appropriateness, meaningfulness, and usefulness of inferences made by the researcher on the basis of the data collected (Wallen& Fraenkel, 2001). Validity can often be thought of as judgmental. According to Patten (2004), content validity is determined by judgments on the appropriateness of the instrument's content. Patten (2004) identifies three principles to improve content validity: 1) use a broad sample of content rather than a narrow one, 2) emphasize important material, and 3) write questions to measure the appropriate skill. Peer examination of the instruments was done to check inconsistency .I also gave the instruments to my supervisors to vet before field operation. I also used triangulation by using multiple sources of data to confirm the emerging findings.

CHAPTER FOUR

PRESENTATTION AND ANALYSIS OF RESULTS

4.0 Introduction

This chapter focuses attention on the analysis of data. The information gathered through in-depth interview and focus group discussions are analyzed and the results are presented in tables as indicated below. The statistical analysis of the data obtained from the interviews, process, monitoring and organizational view is presented with frequency distributions, descriptive statistics, and graphs.

4.1 Demographic Characteristics of respondents

The demographic data was collected on the variables gender, age, marital status, highest educational level, and occupation. This was to ensure that all the major characteristics of the population ware well represented in the study.

4.1.1 Gender of Respondents

Gender group of the respondents was the first demographic data to look at. The gender classification of the respondents is indicated in table 4.1

Table 4.1: Gender of Respondents

Gender	**Frequency (%)**
Female	53(58.24%)
Male	38(41.76%)
Total	**91(100.0%)**

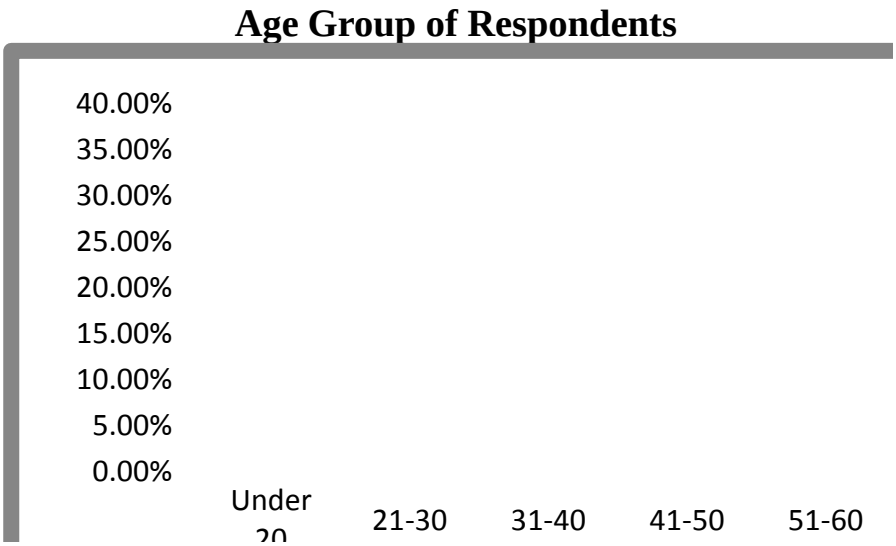
Source: Field survey, 2012

The result indicates that majority of the respondents who participated in the study were female representing 58.7% while the male were in the minority.

4.1.2 Age Classification of Respondents

The age classification of the respondents was the next demographic concern. The age distribution of respondents is indicated in figure 4.1.

Figure 4.1: Age Classification of Respondents



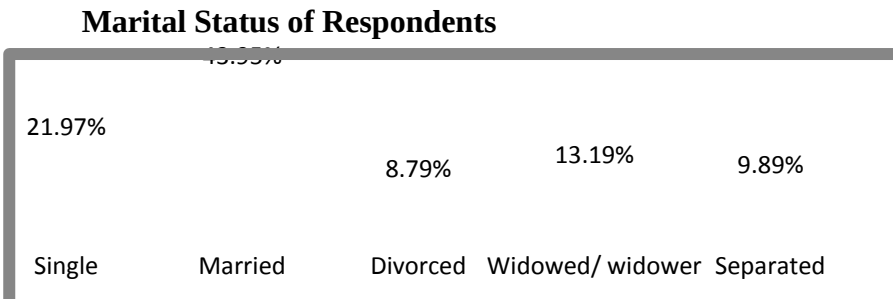
Source: Field survey, 2012

Majority of the respondents who participated in the study were within the age of 41-50(34.0%).Respondents under the age of 20 years were in the minority. Meanwhile respondents within 21 years and 30years were quite high.

4.1.3 Marital Status

Table 4.2 indicates the results on the marital status of the respondents at the time of the survey.

Figure 4.2: Marital Status of Respondents



The result indicates that majority of respondents in the study were married (43.95percent). Divorcees, widows/ widowers and separated were also included in the study. There were equally divorcees, widowed and separated women who were involved in the study with divorcees being the least respondents (8.79 percent). There were also participants who were singles.

Table 4.2 indicates the educational level of respondents.

Table 4.2: Educational Level of Respondents

Educational level	**Frequency (%)**
No formal Education	18(19.78 %)
JHS /Middle school	32 (35.16%)
SHS	10 (10.98%)
Diploma	20 (21.97%)
First Degree	6(6.59%)
Post Graduate	5(5.00%)
Total	**91 (100.0%)**

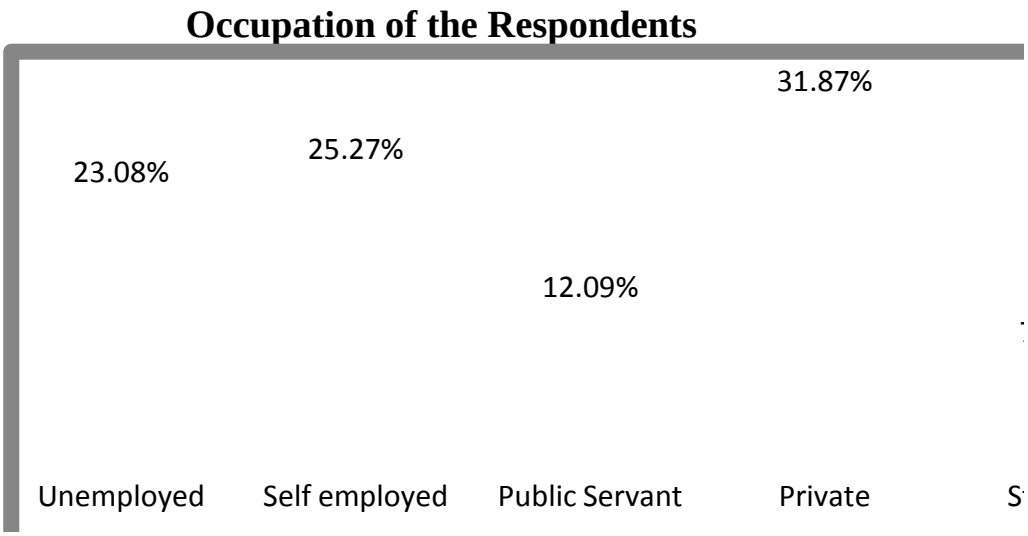
Source: Field survey, 2012

Majority of the respondents had education below tertiary education (46.14 percent). Some of the respondents have no formal education 18 (19.78 %) There were respondents who had had both tertairy (28.56 percent) and post graduate education (5 percent). There were also more women with no formal education (32.1 percent).Table 4.2 indicates that most of the respondents have had some form of formal education.

4.1.4 Occupation of the Respondents

The occupation of the respondents were sought so as to understand the type of work they do. The results are illustrated in figure 4.3

Figure 4.3: Occupation of the Respondents



Source: Field survey

Figure 4.3 shows that the majority of respondents are employed in private organisation (31.87 percent). There are also considerable numbers of the respondents who are self employed (25.27 percent). There are quite a sizeable number of the respondents who are unemployed 21 (23.08%) There also few students who are involved in the study.

4.2 Solid Waste Situation in Ablekuma Central sub Metropolitan area after Private Sector involvement in Waste the Management.

The respondents were asked what the general waste situation is in the Ablekuma sub-Metropolitan area before and after the involvement of Zoomlion Ghana in the management of solid waste. This was asked to establish, at that level, whether the people of Ablekuma Central are satisfied with the sanitation situation in the area. Figure 4.4 shows responses on

the general waste situation in the Ablekuma Central sub-Metropolitan area after the involvement of Zoomlion Ghana in solid waste management in the area.

4.1 Response from Residents on solid waste situation

Figure 4.4: General Waste Situation

Source: Field survey, 2012

Out of 56 respondents, 66.1% believed that the general waste situation is very satisfactory, and 1.8% agreed it's very poor. This is an indication that the residents in the area of study are very satisfied with the general waste situation in the area after the involvement of Zoomlion Ghana in solid waste management. The respondents were again asked whether the current waste disposal arrangement is convenient, a significant number totaling 17.9% of respondents says that there is more room for improvement in the waste situation. However, 82.2% of the respondents agreed to the fact that waste disposal arrangement is convenient by responding to 'Yes' while 17.9% finds waste disposal arrangement inconvenient. Among the explanations given to their response of 'No' is the fact that irregular collection of waste is a major problem as the collection bins get over full and violation of the fortnight arrangement between residents (Clients) and Zoomlion Ghana. Surprisingly, an overwhelming majority of residents of Ablekuma Central sub-Metropolitan are satisfied with the amount charged for the

services provided by Zoomlion Ghana. This is what one of the residents said about the solid waste management situation in the area:

> *Although there are some bottlenecks in the operations of the company, sanitation is much better in the hands of a private organization like Zoomlion than when it was left in the hands of Accra Metropolitan Assembly (A.M.A) as a public entity*.

Another resident said:

> *Even though there has been significant improvement in the sanitation situation, but there is still more room for improvement.*

The results were confirmed by the focus group analysis which revealed that even though there is much improvement in environmental sanitation in the area Zoomlion Ghana still needs to work harder to improve upon the lapses service delivery. This is what one of the participant said:

> *.....if Zoomlion people had been given the opportunity to manage solid waste in the area all this while a lot of people will not have been engulfed with filth, but they also need to improve upon their shortfalls for quality service delivery .*

(FGD, Group 2)

The field workers of Zoomlion were asked what the general waste situation is in the Ablekuma sub-Metropolitan Area. This is what they have to say;

According to one of the fieldworkers of Zoomlion Ghana,

> *Looking at the current solid waste management situation there has been significant improvement. Most of the people have been saying that if Zoomlion had come early, sanitation situation in the area would have been one of the best within the Accra Metropolitan Assembly*

.

Another fieldworker of Zoomlion Ghana limited indicated;

> *Environmental and sanitation problems have been better with the exigency of Zoomlion Ghana.*

Officials of Zoomlion were also asked of their view on solid waste situation in the area .One of the officers have this to say:

> *Ever since they took over management of solid waste in the area there has been tremendous improvement in sanitation and environmental issues.*

Another officer was of the view;

> *That the company has good management policies and due to that they have been able to improve upon the solid waste situation in the area.*

The officials of the waste management department of the Ablekuma central sub metropolitan also affirm that:

> *With the private sector participation in the solid waste in the Ablekuma Central sub Metropolitan area there has been a significant improvement in sanitation.*

The District Cleansing officer also indicated:

> *That with the private sector involvement in the management of the waste in the area there is significant improvement.*

However, residents were quizzed on the environmental sanitation situation in the community after Zoomlion Ghana has taken charge of the waste management in the area. The responses from respondents from the table 4.2 below indicates that 91.1% of the respondents says that the presence of the company has made the area one of the cleanest in the communities in the city, while 8.9% of the remaining respondents saw the community as 'averagely clean'. This is an indication that the presence of Zoomlion Ghana has had a positive impact of environmental sanitation in the Ablekuma Central Community and therefore there is the need to sustain their operations in the community. This is consistent with responses from 25

fieldworkers on the solid waste situation in Ablekuma Central sub-Metropolitan who responded by 100% response that there is a significant improvement in the sanitation situation in the community and that has made the community one of the cleanest in the communities in the city.

Table 4.3: Environmental Sanitation Situation under Zoomlion

Variable	Frequency	Percent
One of the cleanest communities in the city	51	91.1
Averagely Clean	5	8.9
Dirty	0	0.0
One of the dirties communities in the city	0	0.0
Total	**56**	**100**

Source: Field Survey, 2012

An official of Zoomlion Ghana agreed that the environmental sanitation situation has improved and was quick to add that residents and business operators in the area have been provided with waste bins in all sizes for effective waste management which has contributed to the results in the improvement of the waste management situation in the area. Again 2 official of the Municipal Waste Department could not disagree on the fact that the solid waste management situation in the community has improved significantly.

A Supervisor of the Waste Management Department of the sub metro said that;

> *There has been significant improvement in the solid waste situation in the area and that the sub-metro has become one of the cleanest sub-metros within the Accra Metropolitan Assembly.*

When the fieldworkers were interviewed on the current environmental sanitation in the area this is what one of them said;

> *Before we started work in this community almost every part of the community was engulfed with filth but now the situation is different.*

When another fieldworker was asked her opinion about the environmental sanitation situation ever since Zoomlion took over management of waste, this is what she said:

> *The company is really using us to make the community clean at all time but the pay given to us is not sufficient I wish you will talk to our big men to increase our pay.*

During the focus group discussion, majority of the respondents affirmed the views of the other respondents that there is an improvement in the environmental sanitation in the area.

4.3 Strategies of Zoomlion Ghana in Solid Waste Management in Ablekuma Central sub-Metropolitan Area

The researcher tried to find out from residents the strategies used by Zoomlion Ghana in management waste in the area. The results are presented in Table 4.4

Table 4.4: Strategies of Zoomlion Ghana (Residents)

Variables	Frequency	Percent
Door-to-door and use of Tricycle	21	37.5
Public Education and Outreach	11	19.6
Others e.g. Modern equipment vehicles, large workforce	24	42.9
Total	**56**	**100.0**

Source: Field Survey, 2012

In table 4.4, their responses show that the company adopts all sorts of strategies in waste disposal in the sub-Metropolitan. Residents' responses indicates that 37.5% saw the company making use of tricycle and the door to door waste collection as one their strategies in service delivery, 42.9% saw the use of central collection bin at a location, the use of modern waste trucks, large workforce and household collection bins as a strategy to the company, and 19.6% were of the view that 'public education and outreach on waste management' as one of the company's strategies. However, according to residents, attention should be on public education to enlighten residents' knowledge on waste segregation or separation.

Twenty five other respondents were sampled from the fieldworker of Zoomlion Ghana; in-depth interviews were used for them for deeper understanding of the strategies adopted by the company and opinions toward solid waste management in the Ablekuma Central sub-Metropolitan area. During the interview the surroundings were concurrently observed. On their part, 28% mentioned the 'use of tricycle', 28% also mentioned 'Others' like staff motivation. Forty four percent of the fieldworkers of Zoomlion mentioned the 'Door-to-Door concepts'. Table 4.6 represents the number of respondents interviewed from the fieldworkers of Zoomlion Ghana. This indicates that the company varied their strategies in the area.

Table 4.5: Strategies of Zoomlion Ghana (Fieldworkers)

Variable	Frequency	Percent
Use of Tricycle	7	28
Door-to-Door Concept	11	44
Others e.g. polluter pay system, large workforce,	7	28
Total	**25**	**100**

Source: Field Survey, 2012

An interview with four officials of Zoomlion Ghana on the strategies of the company in solid waste management in the area, their views on the strategies are not far-fetched from what the fieldworker and the residents said.

The zonal officer of Zoomlion Ghana had this to say in connection with the strategies used by the company:

> *We have effective supervision, environmental change communication through the use of durbar and radio station locally.*

One of the officials of Zoomlion said:

> *We have modern and improved stock of sanitary equipment, improved monitoring and supervision of our staff especially the fieldworker. We make sure collection of waste is done every day so because of this our field workers do not go on leave unless it is very necessary. He added that in a day the main streets in the sub metro are swept three times morning, afternoon and in the evenings.*

An interview was conducted with two officials of the Municipal Waste Department in the Ablekuma Central sub-Metropolitan area on Zoomlion's strategies. Commenting on the strategies used by Zoomlion Ghana this was what one of them said:

> *Zoomlion Ghana has large workforce coupled with the use of more modern vehicles, regular collection and the tricycle concept which is able to reach and collect waste from places which are not accessible by vehicles.*

The other officer interviewed also had this to say:

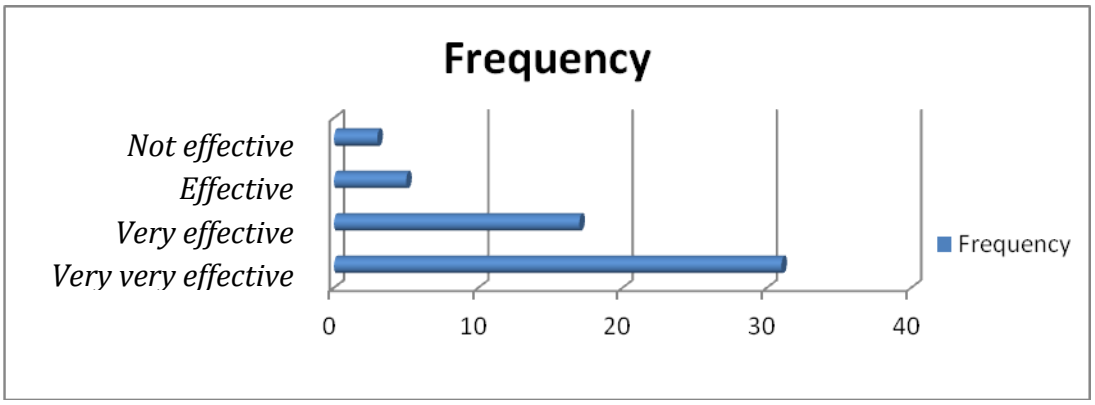
> *Zoomlion Ghana has a lot of facilities for service delivery but unfortunately they break down so quickly and I think government need to help them to import quality equipment to enhance service delivery.*

From the above results gathered from respondents, there is consistency in the strategies adopted by the Zoomlion Ghana in the management of solid waste in the Ablekuma Central sub Metropolitan area which is attested by all respondents in the study.

4.4 Effectiveness of Strategies of used Zoomlion Ghana.

The effectiveness of strategies to residents is another issue of concern. The figure below gives the graphical presentation of the effectiveness of these strategies to the residents of Ablekuma Central sub-Metropolitan Area.

Figure 4.5: Effectiveness of Strategies used by Zoomlion Ghana



Source: Field Survey, 2012

In Figure 4.4, respondents commented on the effectiveness of the strategies employed by Zoomlion Ghana in waste management processes in the area. About fifty-five per cent of respondents saw the effectiveness of strategies adopted by Zoomlion Ghana as 'very very effective, with this majority, it is an indication that residents appreciate the strategies of the company whiles and 5.4% said the strategies of the company are not effective and that there is the need for Zoomlion Ghana to step up its strategies.

Again on the effectiveness of the strategies of Zoomlion Ghana, out of 25 fieldworkers of the company (respondents), 80% saw closed monitoring of fieldworkers is the effective tool of the strategy while 20% said the effectiveness of the company's strategy lies in the use of the tricycle concept and this is attested by the responses from residents on how effective are these strategies to them by a majority response of 'very good'.

When the same issue was put before the four (4) officials of Zoomlion Ghana in waste management in the community under study, the response to the interview questions indicated that the effectiveness of the strategies of Zoomlion Ghana includes frequent servicing of vehicles, they have a mobile workshop that is able to attend to break down of their vehicles, effective and efficient supervision of fieldworker by supervisors and the involvement of opinion leaders in public education and outreach on good environmental sanitation practices.

Again, interviews conducted with two (2) District Cleansing Officers (D.C.O) of the Municipal Waste Department in the Ablekuma Central sub- Metropolitan area on their views on the effectiveness of the strategies adopted by Zoomlion Ghana indicates that the use of Mobile workshop to service break down vehicles, prudent monitoring system that ensure that all workers are on duty and the availability of fieldworkers even on Sundays. From residents through fieldworkers to the D.C.O all agreed that the strategies of Zoomlion Ghana in the community under study are effective.

An officer from the Municipal Waste Department in Ablekuma Central sub-Metropolitan area said:

> *They use mobile workshop to service the break down vehicle, the use of Good monitoring system to ensure that everybody comes to work, the increase in the number workers employed and high standard of supervision.*

4.5 Benefits of Private Sector Participation in Waste Management

In another development, the researchers delved into the area of benefits of private sector participation in waste management in the Ablekuma Central sub-Metropolitan. All the residents asserted that the involvement of the private sector in waste management has brought an unprecedented improvement in the area of sanitation to the sub-Metropolitan area.

In an interview with four officials of Zoomlion Ghana in the Sub-Metro on the same issue of the benefits of P.S.P in waste management, their responses to the interview questions are not different from that of the fieldworkers.

Among the responses from the officials include:

> *The burden on government managing waste in the country is reduced, employment opportunities to the citizenry and the provision of opportunity for people to learn new waste management processes abroad. Some of the workers are sent abroad for training.*

Again interviews with two officials of Municipal Waste Department in the sub -Metropolitan Area are not different from that of the responses from the Zoomlion officials. But in addition they added that:

> *Private sector in waste management contributes to the country's tax web for national development.*

To the fieldworkers, the benefits of private sector participation (P.S.P.) in waste management in the Ablekuma Central sub-Metropolitan area cannot be over-emphasized. Out of the 25 respondents (fieldworkers) 76% of the respondents saw that the P.S.P has created employment for most people to reduce the unemployment rate facing the country, 12% looked at it from the point that the P.S.P has strengthened the decentralization of waste collection in the community and 12% mentioned 'Others' of the benefits of P.S.P in waste management in the Ablekuma Central sub-Metropolitan area.

The table 4.6 below shows the responses from respondents on benefits of Private sector participation in solid waste.

Table 4.6: Benefits of Private Sector Participation in Waste Management

Variables	Frequency	Percent
Employment	19	76
Decentralization of waste collection	3	12
Others e.g. efficiency, increases in tax revenue to government etc.	3	12
Total	**25**	**100**

Source: Field Survey, 2012

Focus group discussions conducted supported this finding. The participants in the discussion shared similar opinion with the other respondents. One of the participants said:

> *Zoomlion Ghana has really given employment opportunity to the residents especially the young people who are out of school for various reasons.*

This indicates that private participation in waste management is of paramount benefit to the community and the nation at large.

4.6 Challenges of the Activities of Zoomlion in Ablekuma Central sub-Metropolitan

The researcher went further to enquire from residents whether Zoomlion Ghana faces some challenges in their activities in the area. About fifty- five per cent of the respondents said that they do not see any challenges facing the activities of Zoomlion Ghana. However, a significant number of respondents 44.6% believed that Zoomlion Ghana has some challenges in the discharge of their services in the community.

A trader at Kaneshie market complained bitterly about the apathy of the some field workers of Zoomlion, that:

> *The Zoomlion people are doing well in the waste collection in the area but sometimes they delay in the collection. The refuse will be left for days before they are collected which is not good.*

A resident expressed reservation about the way the Zoomlion people collect their fees. He lamented that:

> *The Zoomlion people will issue threat that if you do not pay your fees your waste will not be collected and I think is not good enough for us but when they failed to collect the refuse as scheduled we don't reduce the their service charge.*

Another resident also explained the effect of charging waste collection fees, that:

> *The fees charged by the Zoomlion people are high, they charge a lot of money and thus some people find it difficult to pay so they still do illegal dumping of refuse, for instance anytime it rains they put the waste into the running water.*

A resident Mataheko also lamented that:

> *The frequent break-down of Zoomlion's waste trucks inhibit the regular collection of the waste and the unavailability of dumping site affect the regular service delivery to them (clients).*

But on the contrary, during one of the focus group discussions the participants were of the view that:

> *Zoomlion Ghana is doing well and there is nothing wrong with their activities in the area, government need to give them the necessary support for them to continue with the good work they are doing..(FGD, Group 3).*

When the same questions were posed to the 25 fieldworkers of the Zoomlion, the challenges varied from service delivery to management and financial issues.

One of the fieldworkers has this to say:

> *Management does not allow us to go on leave and our salary too is not anything to talk about, because of this we are not able to attend some social functions of our loved ones and relation outside Accra.*

Another fieldworker lamented that*:*

> *Sometimes they do not have the necessary logistic to deal with some peculiar problems with regards to solid waste collection.*

Table 4.7: Challenges of the Activities of Zoomlion Ghana

Variable	Frequency	Percent
Frequent Break down of vehicle	11	44
Delays in Payment of service delivery	7	28
Delays in payments of salaries	3	12
Others e.g. insufficient logistics	4	16
Total	**25**	**100**

Source: Field Survey, 2012

The Table 4.6 above shows responses from 25 fieldworkers of Zoomlion Ghana on the challenges of the activities of the company in the sub Metropolitan. Out of 25 respondents, 44% of the respondents saw frequent break down of vehicles for the discharge of duties is the main challenge of the company's activities, 28% agreed to delays in payments of service delivered to residents, 12% were of the view that delays in the payments of their salaries and 16% viewed other challenges.

However, in an interview with the 4 officials of Zoomlion Ghana, these officers asserted that the challenges are enormous in the area of solid waste management in the community. They agreed to the responses from their fieldworkers but added that some of the challenges mentioned by the fieldworkers are repercussion effect from challenges of management, residents and government. An official of Zoomlion Ghana identified some challenges they face in their service delivery.

Among the challenges include:

> *Irregular and delay in payments of subsidy from government, attitudes and behavioural problem of residents in the community when this happens it affect the efficiency of their service delivery.*

The zonal officer was of the view that:

> *Getting landfill sites are the major challenges facing management. We used to send the refuse to "Oblogo near Weija but now the place is full so we have to transport the waste all the way to Abokobi which increases our operational cost.*

An interview report from the Municipal Waste Department on the challenges of the activities of Zoomlion Ghana is consistent with the interview report from the officials of Zoomlion Ghana.

The District Cleansing Officer also identified resource constraints as a challenge. She said that:

> *It looks as if the country of origin of the vehicles of Zoomlion Ghana is of Low quality and that the government should rather import more durable Vehicles for the service provider at a reasonable cost.*

Despite the contrary view shared by one of the focus groups, it can be concluded that all is not smooth for the company in the discharge of services in the community.

4.7 Sustenance Private Sector Participation in the Solid Waste Management

On the issue of sustenance of private sector participation in the solid waste management, it was unanimously agreed by all respondents in this study that it is worth sustaining for the development of the communities, Zoomlion and the country at large. However, respondents indicated the following for the sustenance of PPP; effective stakeholders collaboration and that the government should resource the private companies in solid waste management

programme, sanitation laws and regulations must be enforced, regular in-service training for supervisors of Zoomlion Ghana in particular, and devoid of political interference in the activities of the operation of companies in the sector and this would attract more private companies into the sector to get involved in the sanitation and environmental management issues.

As to how to sustain private sector participation in solid waste management, this is what one of the residents said:

> *Sustainability of the private participation in waste management is multi-dimensional approach and a policy-mixed which should involve the government, the private sector and the citizenry.*

The findings are collaborated by the views shared by individuals who participated in the focus groups. From residents, one of the participants said:

> *…creation of enabling environment by government, community cooperation and the enforcement policy framework on waste management will help sustain PPP. (FDG, Group1)*

The study concludes that the enabling environment needs to be created for the sustenance of PPP in service delivery in the country.

CHAPTER FIVE

DISCUSSION OF RESULTS

5.0 Introduction

This chapter discusses the major findings of the study related to the objectives, reviewed literature and the theoretical framework under which the study is underpinned. The discussion starts with the demographic characteristics of the respondents and continues to look at general waste situation in the study area, strategies of Zoomlion Ghana in solid waste management, effectiveness of the strategies of Zoomlion Ghana in solid waste management in the Ablekuma Central sub-Metropolitan area, benefits of private sector participation in waste management, challenges faced by Zoomlion in the management of solid waste and sustenance private sector participation in waste management in Ghana.

5.1 Demographic Characteristics of Respondents

The study collected data on the demographic characteristics of respondents with reference to their age, gender, marital status, highest educational level attained, and occupation. This was collected to enable the researcher establish the relationship between the variables.

5.2 General Waste Situation in Ablekuma Central sub-Metropolitan Area

The research investigated to know the current solid waste situation in the Ablekuma Central sub-metropolitan area after Zoomlion Ghana has taken over the management of the solid waste situation in the area, so respondents were asked what the general waste situation is in the Ablekuma Sub-Metro Area. The people of Ablekuma Central are satisfied with the sanitation situation in the area. From the responses, the residents are of the view that the general waste situation is very satisfactory. The study revealed that the sanitation situation in the area has improved significantly ever since Zoomlion Ghana took

over the management of the solid waste in the area despite some few challenges. Comparing the service provided by Zoomlion Ghana with that of the Ablekuma Central sub-Metropolitan Assembly, it is clear the private waste management institution collect more waste. One can then say that Zoomlion Ghana is doing a better job since they collect more solid waste. This is confirmed by KMA, (2009) which indicated that private companies collected 501 tonnes/day whiles KMA collected 44 tonnes/day out of a total of 1200tonnes of solid waste generated in the Kumasi Metropolis.

The study findings revealed that there are two systems of solid waste collection in Ablekuma Central sub-metropolitan area, namely; door-to-door collection and communal system. The door-to-door collection system is used in the high income areas while the communal system is used in the low income areas. The study findings also revealed that there is only one private waste service provider in Ablekuma Central sub- Metropolitan.

5.3 Strategies of Zoomlion Ghana in Solid Waste Management

The research revealed that Zoomlion Ghana has improved strategies which they have employed in the management of solid waste in the Ablekuma Central sub-metropolitan area. The company has employed large workforce to deal with the increasing sanitation problem in the area. It came to light that the waste management department of the Ablekuma Central sub- Metropolitan does not have adequate number of staff, Zoomlion uses of more modern vehicles, regular collection and the tricycle concept which is able to reach and collect waste from places which are not accessible by vehicles. An interview with the WMD and Zoomlion Ghana revealed that effective supervision is one of the strategies being used to ensure good service delivery in the area. This is confirmed by Tia (2006) the private solid waste collection companies equally carry out monitoring

activities as far as solid waste collection is concern. The biggest private waste collection company in the Metropolis, Zoomlion, has a landfill supervisor who visits the landfill on a daily basis to monitor leachate, odour and the unsightly nature of the landfill. It also came to light that the workers are well resourced to deal with the waste situation.

5.4 Effectiveness of the Strategies of Zoomlion Ghana in Solid Waste Management in the Ablekuma Central sub-Metropolitan Area.

From the interview with residents on the effectiveness of the strategies employed by Zoomlion Ghana in waste management processes in the area, 55.3% of respondents saw the effectiveness of strategies adopted by Zoomlion Ghana as 'very good', and 5.4% said the strategies of the company was 'poor'. With this majority, it is an indication that residents appreciate the strategies of the company. However, 14.3% saw the strategies as not too effective and there is the need for Zoomlion Ghana to step up its strategies. According to Post, Broekema & Obirih-Opareh (2003), service effectiveness can be assessed in terms of reliability and frequency of collection. In terms of frequency of collection, the study findings reveal that people in high income areas receive regular collection in a week while those in low income areas receive irregular collection in a week. In terms of reliability, services in the low income are reportedly unreliable. The study findings show that Zoomlion Ghana is able to remove almost all waste from the neighbourhood, hence their strategies are effective.

In further attempt to find out of the effectiveness of the strategies of Zoomlion Ghana from the fieldworkers, out of 25 fieldworkers of the company interviewed, majority believed closed monitoring of fieldworkers as the effective tool of the strategy, while 20% said the effectiveness of their strategy lies in the use of the tricycle concept and this is attested by the responses from residents on how effective are these strategies to them by a majority

response of 'very good' with 55.3%. However, on the same issue put before the four (4) officials of Zoomlion Ghana in waste management in the community under study, the response to the interview question indicates that the effectiveness of the strategies of Zoomlion Ghana includes frequent servicing of vehicles and tricycle, effective and efficient supervision by supervisors and the involvement of opinion leaders in public education. However, interviews conducted with two (2) District Cleansing Officer (D.C.O) of the Municipal Waste Department in the Ablekuma Central sub- Metropolitan Area on their views on the effectiveness of the strategies adopted by Zoomlion Ghana indicate that the use of Mobile workshop to service break down vehicles, prudent monitoring system that ensure that all workers are on duty and the availability of fieldworkers even on Sundays. This is an indication that from residents through fieldworkers to the D.C.O agreed that the strategies of Zoomlion Ghana in the community under study are effective.

About the effectiveness of the strategies of Zoomlion Ghana, an officer from the Municipal Waste Department in Ablekuma Central sub-Metropolitan area said:

> *Zoomlion Ghana use mobile workshop to service the break down vehicle, the use of good monitoring system to ensure that everybody comes to work, the increase in the number workers employed and high standard of supervision.*

Several authors consider privatisation as a necessary vehicle in service delivery. Cointreau-Levine (2000) argues that, privatisation brings in private sector investment and improves operational efficiency. Coad (2005) in support of the above points that, the private sector is more efficient, effective, increases coverage, has expertise and improves standards, and has access to capital.

Empirical evidences from the Asian cities confirm why private contractors collect solid waste more efficiently than the public sector. In Kuala Lumpur, Lee (1997) mentions that private firms made more trips per day for each vehicle and collected more waste on each

trip than public departments. In Seoul, the private sector showed a markedly higher level of labour efficiency and vehicle efficiency in waste collection and transport (Kim 1991). In Malaysia, the results of a study of privatised rubbish collection services in 17 Municipalities showed that the level of collection was better with privatised services in 11 out of the 17 Municipalities (Sinha 1993).The finding is supported by the theory of participation which has shown that decentralization of governance enhance effectiveness and efficiency.

It can be concluded that the strategies used by Zoomlion in their service delivery are effective.

5.5 Benefits of Private Sector Participation in Solid Waste Management.

The environmental sanitation policy of Ghana MLGRD, (1999) suggests that, the bulk of environmental sanitation services shall be provided by the private sector, including NGOs and community based organizations under the supervision of the Public Sector, especially the Metropolitan, Municipal and District Assemblies. Residents asserted that the involvement of the private sector in waste management has brought an unprecedented improvement in the area of sanitation to the sub-Metropolitan area.

In an interview with 4 officials of Zoomlion Ghana in the sub-Metropolitan on the same issue of the benefits of PPP in waste management, their responses to the interview questions are not far different from that of the fieldworkers. The response from the officials were collaborated by 2 officials of Municipal Waste Department in the Ablekuma Central sub Metropolitan area. They added that private sector in waste management contributes to the country's tax web for national development.

An interview with the fieldworkers on the benefits of private sector participation (P.S.P.) in waste management in the Ablekuma Central sub-Metropolitan Area cannot be over-emphasized. Out of the 25 respondents 76% of the respondents saw that the PPP has created employment to most people to reduce the unemployment rate facing the country, 12% looked at it from the point that the PPP in the solid waste management has led to the decentralization of waste collection and 12% said there were other of benefits of P.S.P in waste management. The responses indicate that private participation in waste management is of paramount benefit to the community and the nation at large.

5.6 Challenges that Zoomlion Encounter in the Management of Solid Waste in Ablekuma Central Sub-Metropolitan Area

The study revealed that 55.4% of the respondents say that they do not see any challenges of the activities of Zoomlion Ghana. However, a significant number of respondents 44.6% believed that Zoomlion Ghana has some challenges in the discharge of their activities in the community. Residents spelt out some of the challenges of the company which include the frequent break-down of their waste trucks that inhibit the regular collection of the waste and the unavailability of damping site and which affects the regular service delivery to clients. This is an indication that all is not all smooth for the company in the discharge of the activities.

To the 25 fieldworkers of the company, the challenges of the activities of Zoomlion Ghana in the area vary from service delivery to management and financial issues.

Out of 25 respondents, majority of the respondents representing 44% saw frequent break down of vehicles as the main challenge of the company's activities, 28% agreed to delays in payments of service delivered to residents, 12% are of the view that delays in the

payments of their salaries and 16% viewed other challenges. However, in an interview with the 4 officials of Zoomlion Ghana, they asserted that the challenges are enormous in the area of solid waste management in the community. The four officials of Zoomlion agreed to the responses from their fieldworkers but added that their (fieldworkers) challenges are repercussion effect from challenges of management, residents and government. Among the challenges include; irregular and delay in payments of subsidy from assembly, attitudes and behavioural problem of residents in the community and the difficulty in getting landfill sites are the major challenges facing management.

An interview report from the Municipal Waste Department on the challenges of the activities of Zoomlion Ghana is consistent with the interview report from the officials of Zoomlion Ghana. The delay in payment of subsidy from the Assemblies is a major setback which is a source of worry to the service provider. Inadequate government financial support and delayed payment of government subsidies make it difficult to go to financiers and secure long term funding to meet the capital and operational requirements in solid waste management. This is confirmed by a study conducted by Tia (2006) the irregularity of financial inflow was one of the key challenges which run through the two private solid waste collecting companies as a basic problem hindering their operations within the metropolis. Also, there are no tax reliefs and incentives in the management and procurement of equipment.

According to an official of Zoomlion added that some people have bad attitude towards sanitation as a result of lack of civic education, enforcement of regulations and low level of modern sanitation and hygienic practices among the populace. He added that only few

people are willing to pay for collection and disposal of waste. The practice of waste sorting, recycling and reuse of waste are scarcely practiced.

5.7 Sustenance Private Sector Participation in Waste Management in Ghana

The study revealed that private sector participation in the solid waste management need to be encouraged. Majority of the respondents were of the view that everything possible must be made to sustain private sector participation in the solid waste management in the country. However, respondents indicated the following for its sustenance; effective stakeholders collaboration, government should resourced the private companies in solid waste management programme, sanitation laws and regulations must be enforced, regular in-service training for supervisors of Zoomlion Ghana in particular, and devoid of political interference in the activities of the operation of companies in the sector and this would attract more private companies into the sector to get involves in the sanitation and environmental management issues.

One of the District Cleansing Officers reiterates that*:*

> *The government should resource the Motor and Sanitation Courts to enforce sanitation laws and regulations in the country.*

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

The chapter looks at the overview of the study, conclusions and recommendations based on findings as presented in the previous chapter.

6.1 Overview of the Study

The study sought to evaluate Zoomlion Ghana's participation in solid waste management in Ablekuma Central sub Metropolitan area. The objectives of the study were, to describe the solid waste situation in Ablekuma Central sub-Metropolitan area before and after private sector involvement in waste management in the area, identify the strategies of Zoomlion Ghana in solid waste management in Ablekuma Central sub-Metropolitan area, find out the effectiveness of the strategies of Zoomlion Ghana in solid waste management in the Ablekuma Central sub- Metropolitan area, examine the challenges that Zoomlion Ghana encounter in the management of solid waste in the Ablekuma Central sub-Metropolitan area, assess the benefits of private sector participation in waste management in Ablekuma Central sub Metropolitan area and to identify ways of sustaining private sector participation in waste management in Ghana. An evaluative case study method research design was used for the study. Three instruments were employed for data collection in this research study: in-depth interview, interview scheduled and focus group discussions.

6.2 Summary of Findings

The study revealed that it is only Zoomlion Ghana who provides wastes management services to the people of Ablekuma Central sub-Metropolitan area. The study revealed that solid waste management situation in the Ablekuma Central sub-Metropolitan Area has

significantly improved. The study also brought to light the strategies used by Zoomlion Ghana in the management of solid waste in the area. These strategies includes door- to-door waste collection , the use of tricycle concept ,use of modern waste collection trucks , environmental change communication through the use of durbar and the local FM station, and also the have a stand by mobile workshops which promptly attend to any broken down trucks.

The study also showed that private public partnership has a lot of benefits. Some of the benefits include job opportunities to the youth, increase in tax revenue to government for national development and involvement of the residents by paying for the service delivery.

Despite the benefits that the PPP has brought there were some challenges that Zoomlion faced in their service delivery, ; irregular and delay in payments of subsidy from assembly, attitudes and behavioural problem of residents in the community and the difficulty in getting landfill sites are the major challenges facing the management of Zoomlion Ghana. In other to sustain PPP, the study revealed that there should be effective stakeholders collaboration. Government should resource the private companies in solid waste management programme, sanitation laws and regulations must be enforced, regular in-service training for supervisors of Zoomlion Ghana in particular. There should also be no political interference in the activities of the operation of companies in the sector and this would attract more private companies into the sector to get involves in the sanitation and environmental management issues.

6.3 Conclusion

The study revealed that solid waste and sanitation situation in the Ablekuma Central sub-Metropolitan area has been improved significantly. Residents are quite happy with the

involvement of Zoomlion in the management of solid waste in the area. It was revealed that Zoomlion Ghana uses various strategies in managing waste in the area which includes regular door-to door collection and tricycle concept use of modern waste collection trucks, effective supervision and monitoring of the companies resource, environmental change communication through the use of durbar and the local FM station. They also have a stand-by mobile workshop which promptly attended to any broken down truck.

It was therefore concluded that decentralisation of services by involvement of private sector brings a lot of efficiency and effectiveness and this reduces the pressure on central government.

6.4 Recommendations

Based on the findings of the study, the following measures are recommended for efficient and effective management of solid waste in Ablekuma Central sub metropolitan area. These are discussed below:

1. Provision of Relevant Information on Clients Role

Clients should be provided with relevant information on their role in delivering quality service in waste management. This is necessary because majority of the clients asserted that they had no knowledge of their role in delivering quality service in waste management.

2. Education of Clients about the Benefit of Waste Management

Zoomlion Ghana in collaboration with the Waste Management Department should intensify public education on the benefits of proper waste management. This will help the residents to be aware of the benefits they stand to gain when they maintain proper waste management

processes. This is important because majority of the clients had no knowledge of the benefit and believes government is responsible to keep their surroundings clean.

3. Attention to Clients Complaints

Clients complaints lodged at the offices of Zoomlion should be given the needed attention and consideration in order for the company to gain the trust and loyalty of the clients. This is highly recommendable because majority of the clients asserted that their complaints were not given quick responses. This can be done by creating a complaint desk that can satisfactorily address client problems without delay, and provide them with feedback.

4. Enforcement of Regulations on Waste Disposal

The study has proved that the residents have negative attitude toward waste disposal. To curtail this negative public attitude to waste disposal, the sub metro must strictly enforce existing by-laws on waste disposal. Before these by-laws are implemented to the latter, there should be enough public for all the residents education. Penalties for waste disposal offences should include court fines, signing of bond of good behaviour, orders and even imprisonment depending on the gravity of the offence committed. Such enforcement measures could change the rather poor waste disposal culture among the residents.

To facilitate the enforcement of by-laws on waste disposal, the existing environmental sanitation guards need to be well equipped for the task. They also need the support of the law- enforcing agencies such as the police and the courts to help bring offenders to order. These measures will go a long way to improve the waste disposal situation in the area and also make the work of the service provider easy.

5. Use of Integrated Solid Waste Management Model

The Integrated Solid Waste Management should be adopted to ensure effective solid waste management in the area. Residents should be encouraged by Zoomlion Ghana and the waste management department of the sub metropolitan to separate the waste generated into their various components before final disposal. When the wastes are separated those that can be reused will be used and those that can be recycled will also be recycled. The food waste can be composted for manure, incinerate those that are combustible and land filled those that cannot be reused or recycled. Waste should be regarded as a great economic resource. The segregation, re- use and recycling of waste at the household levels or point of generation should be supported and funded at the government level. This should be taken as a national assignment with private sector involvement.

6.5 Areas for further research

A study should be conducted on enhancing private sector participation in solid waste management in Ghana.

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APPENDIX 1

IN-DEPTH INTERVIEW WITH OFFICIALS OF ZOOMLION GHANA

My name is Davis Mawuena Aweso, a Master of Philosophy student at the Institute of Continuing and Distance Education of University of Ghana. My thesis is to assess the solid waste management situation in Ablekuma Central sub-Metropolitan area before and after the involvement of Zoomlion Ghana.

Your responses will help me make vital analyses on the topic under study. Your privacy would be protected. You do not need to provide your name. Only the general results, conclusions and recommendations drawn from these analyses would be included in the final report and not the individual responses.

Position……

Sex …… Age……Educational qualification…….

1. How long have your organisation been operating in this area?
2. Has there been any improvement in the solid waste management situation in the area ever since your organisation took over management of solid waste in Ablekuma Central sub-Metropolitan area?
3. What did you do different to improve upon the situation?
4. What specific strategies have you organisation use in management of solid waste in the area delivery?
5. What makes the strategies of your organisation effective?
6. Are there challenges you face in your service delivery and how do you overcome it?
7. In what way has Public –Private Partnership has been beneficial to us?
8. How do we sustain Public –Private Partnership?
9. What suggestions would you give to enhance private sector participation in Ghana?

APPENDIX 2

IN-DEPTH INTERVIEW WITH FIELDWORKERS OF ZOOMLION GHANA

My name is Davis Mawuena Aweso, a Master of Philosophy student at the Institute of Continuing and Distance Education of University of Ghana. My thesis is to assess the solid waste management situation in Ablekuma Central sub-Metropolitan area before and after the involvement of Zoomlion Ghana.

Your responses will help me make vital analyses on the topic under study. Your privacy would be protected. You do not need to provide your name. Only the general results, conclusions and recommendations drawn from these analyses would be included in the final report and not the individual responses.

Position……

Sex …… Age……Educational qualification……..

10. How long have you been operating in this area?
11. Has there been any improvement in the solid waste management situation in the area ever since your organisation took over management of solid waste in Ablekuma Central sub Metropolitan area?
12. What did you do different to improve upon the situation?
13. What specific strategies have you organisation use in management of solid waste in the area delivery?
14. What makes the strategies of your organisation effective?
15. Are there challenges your organisation faces in service delivery and how do you overcome them?
16. In what way has Public –Private Partnership has been beneficial to us?
17. How do we sustain Public –Private Partnership
18. What suggestions would you give to enhance private sector participation in Ghana?

APPENDIX 3

IN-DEPTH INTERVIEW WITH OFFICERS OF WASTE MANAGEMENT UNIT

My name is Davis Mawuena Aweso, a Master of Philosophy student at the Institute of Continuing and Distance Education of University of Ghana. My thesis is to assess the solid waste management situation in Ablekuma Central sub-Metropolitan area before and after the involvement of Zoomlion Ghana.

Your responses will help me make vital analyses on the topic under study. Your privacy would be protected. You do not need to provide your name. Only the general results, conclusions and recommendations drawn from these analyses would be included in the final report and not the individual responses.

Section A: Solid waste situation in Ablekuma Central sub-Metropolitan area after private sector involvement in waste management in the area.

1. How will you describe the general waste situation in your neighbourhood?

2. How would you rank environmental sanitation in the sub Metro after Zoomlion Ghana has taken charge of the solid waste management?

Section B: The strategies of Zoomlion Ghana in solid waste management in Ablekuma Central sub-Metropolitan area

1. Are there strategies that Zoomlion Ghana uses in provision of service in the sub Metro?

2. If yes, what are the strategies?

3. How different are their strategies from yours?

4. What is your own department's role in waste management in the area?

Section C: Effectiveness of the strategies of Zoomlion Ghana in solid waste management in the Ablekuma Central sub-metropolitan area.

1. How effective are the strategies employed by Zoomlion Ghana in management of solid waste in the sub Metropolitan area?

2. How do they ensure the effectiveness of their strategies?

3. Would you say the strategies used by Zoomlion Ghana in management of solid waste in the Sub Metro are the best practices?

4. How will you describe the quality of solid waste collection by Zoomlion Ghana?

Section D: Challenges of the activities of Zoomlion Ghana in Ablekuma Central sub-metropolitan area

1. Are there some challenges you have with the activities of Zoomlion Ghana in the sub Metropolitan?

2. Do they deliver their services on schedule?

3. Do you often receive complains from the end–users about the activities of Zoomlion Ghana limited?

Section C: benefits of private sector participation in waste management in Ablekuma Central Sub-Metropolitan area.

1. Would you support the idea of private sector participation in solid waste management in the Sub Metropolitan?

2. What are some of the benefits of private sector involvement in solid waste management in the sub Metro and the nation at large?

Section F: Sustenance of private sector participation in solid waste management.

1. In what ways can we sustain private sector participation in solid waste management in the country?

2 How do we create the enabling environment for the private sector involvement the management of solid waste in the country?

3. What support must the government give for the sustenance of private sector participation in solid waste management in the country?

APPENDIX 4

FOCUS GROUP DISCUSSIONS FOR RESIDENTS OF ABLEKUMA CENTRAL SUB- METROPOLITAN AREA

1. Has there been any improvement in the solid waste management situation in the area since Zoomlion Ghana took over the management of solid waste in the area?
2. What strategies do you use in the service delivery?
3. How do you assess the strategies used by Zoomlion in service delivery?
4. What does Zoomlion do different to improve upon the solid waste management situation in the area?
5. How often do you collect waste in the area?
6. Are you satisfied with the service charge?
7. Are there some challenges that you face in their service delivery and how are they handled?
8. Are conditions right for private sector participation in the solid waste management sector in the country?
9. What suggestion would you give to Zoomlion Ghana to enhance their service delivery?