

UNIVERSITY OF GHANA

COLLEGE OF HUMANITIES

**AN ASSESSMENT OF THE CONGRUENCE OF THE ENVIRONMENTAL
SANITATION POLICY (2010) WITH PRACTICE OF SOLID WASTE MANAGEMENT
IN THE LEDZOKUKU KROWOR MUNICIPAL ASSEMBLY (LEKMA)**

BY

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OF MPhil POLITICAL SCIENCE DEGREE.**

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DECLARATION

I, JEMIMAH EWUSI, do here declare that this thesis is a product of my effort, handwork and independent judgement. With the exception of quotes and ideas from other sources that have been duly acknowledged, the author is fully responsible for any errors that would be identified in this work.

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ABSTRACT

The management of solid waste is becoming a daunting challenge in many developing countries and governments have used policies as tools to guide them in its management. However, the gap between policy and practice keeps widening. This study sought to assess the congruence of the Environmental Sanitation Policy with practice of solid waste management in the Ledzokuku Krowor Municipal Assembly. The goal of the policy as well as its focus areas were identified. The study also explored how the policy has been implemented, the success and the challenges encountered during the implementation.

The Integrated Sustainable Waste Management model was used as the theoretical framework to understand why solid waste problems still persist despite the existence of the Environmental Sanitation Policy. A combination of qualitative and quantitative method was used to gain a deeper understanding of the solid waste practices in the municipality.

The study found that the Assembly is doing its best to implement the principles of the policy. However, the lack of commitment and unavailability of resources among others to undertake actions spelt out in the policy is a major impediment to the policy's implementation. Also, the study found that a lack of integration between actors, elements and laws governing solid waste is another reason why solid waste is still a problem in the municipality.

DEDICATION

I dedicate this work to my family. I am grateful for their care, support and encouragement during this period of my education. I could not have come this far without your help.



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Figure 1: The original ISWM model developed by WASTE (2001)

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LIST OF ABBREVIATIONS

LEKMA	Ledzokuku Krowor Municipal Assembly
ESP	Environmental Sanitation Policy
MMDAs	Metropolitan, Municipal and District Assemblies
ENSADA	Environmental Sanitation Day
ISWM	Integrated Sustainable Waste Management
SPSS	Statistical Package for Social Sciences
SWM	Solid Waste Management
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
HtH	House to House
CCC	Communal Collection Centre
HRM	Human Resource Manager
PPP	Public Private Partnership

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter discusses the background of the study, the statement of the research problem, the research objectives and the research questions. The others are; significance of the study, the study limitation and the organization of the study.

1.1 Background of the Study

As the world aims toward sustainable development, most countries are faced with the looming crisis of high solid waste generation resulting from rapid population growth, urbanization and changing consumption patterns. According to Hoornweg and Bhada – Tata (2012), “the current global waste generation rate of 1.3 billion tonnes per year is expected to increase to 2.2 billion tonnes per year by 2025 and the hardest to be hit by these statistics are developing countries where urbanization is on the rise”. The accompanying cost of managing such waste is also “expected to increase from \$205.4 billion to \$375.5 billion by 2025 (Hoornweg and Bhata – Tata, 2012)”. This would be severely felt in low income and low-middle income countries.

“While in developed countries the collection of waste is generally efficient and the disposal safe, developing and transitioning countries like Ghana are still struggling to provide universal access to waste collection services, eliminating uncontrolled disposal, burning and moving towards environmentally sound management of all waste (Croset, 2014; UNEP, 2015)”. “The problem has

been compounded by the introduction of environmentally unfriendly materials, changing consumer patterns, lack of political commitment, insufficient budgetary allocations and ill motivated workforce (Oteng –Ababio, 2011)”. The poor management of waste by local authorities and governments alike has left burgeoning cities living virtually in waste and squalor (Tacoli, 2012; Worrell and Vesalind, 2012).

Owing to the serious implications of ill managed solid waste on human health and the vitality of the environment, solid waste management has become one of the key areas of public policy in many countries (Hezri, 2010; Seow and Abas, 2016). Studies acknowledge that the complexity of waste composition and its ever increasing generation rate makes it imperative for countries to have a clear policy on waste management and legislation to realize that policy (Periathamby, Hamid and Khidzir, 2009; Sreenivasan et al, 2012; Seow and Abas, 2016). Policy serves as a tool for government to control the activities of civilians in order to achieve aspirations in the interest of the public (Seow and Abas, 2016). It is not surprising therefore to find that governments are increasingly formulating policies and adopting new initiatives intended to improve waste management practices (Seow and Abas, 2016).

Ghana over the years has had many challenges with solid waste management in its urban areas. This is obvious in many areas in Accra where residents have to cope with uncollected refuse heaps for more than the stipulated collection times (Amoah and Kosoe, 2014). In some cases as described by Oteng-Ababio (2013), residents burn or dump refuse in streams and stagnant gutters leading to breeding grounds for disease spreading insects and vermin. To curb this seemingly intractable

problem, different governments have undertaken a number of initiatives, of which one of them is the formulation of the Environmental Sanitation Policy.

In 2010, the Ministry of Local Government and Rural Development (MLGRD) in collaboration with some key actors in the waste management sector revised the obsolete Environmental Sanitation Policy of 1999 to meet growing international and national context (Boamah, 2011). The overall goal of the policy is “to develop a clear and nationally accepted vision of environmental sanitation, as an essential social service and a major determinant of health and life in Ghana” (Environmental Sanitation Policy, 2010). The policy outlines different types of wastes generated within the country, provides guidelines as to how they should be dealt with and assigns responsibilities to various individuals and institutions.

It is assumed that with the existence of such a comprehensive document that provides the framework for waste management along with increase in resources pumped into sanitation projects by donors and governments alike, there should be significant improvement in the cleanliness of our environment. Though policies formulated on solid waste in most countries have the same agenda of achieving effective management in social, economic and environmental terms, their enforcement and implementation varies (Hezri, 2010; Seow and Abas, 2016). These variations in the assertion of Themelis and Mussche (2013) has drawn the attention of many scholars to study the process of policy development and implementation.

A number of policy studies on solid waste management have identified that, in many countries a proliferation of solid waste policies tailored to meet international standards and to attain effective

waste management exist (Seow and Abas, 2014; Seow and Abas, 2016; Haregu, Ziraba and Mberu, 2016; Dangi, Scheonberger and Bolangi, 2017). Nonetheless, the gap between policy and implementation keeps widening (Mwesigye et al, 2009; Seow and Abas, 2016; Ekane et al, 2016; Dangi, Scheonberger and Bolangi, 2017).

1.2 Statement of the Research Problem

In recent times, solid waste management has received a lot of scholarly attention worldwide. The increased interest is not only about high waste generation as a result of rapid urbanization, change in consumer patterns and economic development but the difficulty facing most city authorities in effectively dealing with the menace (Oteng- Ababio, Owusu-Sekyere and Amoah, 2017). Literature suggests that developed countries are effectively managing their waste and are more focused on how to maximize resource recovery (Ali, 2010; Themelis and Kaufman, 2010; Marshall and Farahbakhsh, 2013). On the contrary, developing countries still struggle with waste after years of experimenting with solutions from their developed counterparts (Oteng- Ababio, Owusu-Sekyere and Amoah, 2017).

In Africa, it has been found that numerous challenges faced in waste management are one way or the other linked to governance. The greatest governance challenges identified as retarding progress in the region are related to policy issues (Ekane et al, 2016). Galan et al (2013) found that out of an investigation of 34 countries in Sub-Saharan Africa (SSA), 18 had national sanitation policies prepared by government and endorsed by parliament. However, their findings show that the mere

presence of national sanitation policies and budget allocation for sanitation did not necessarily translate to concrete action or investment on the ground.

In spite of the admission of a gap between policy and implementation in developing countries, studies that have specifically assessed the congruence or coherence between policy and solid waste management practices in Africa are scanty (Haregu, Ziraba and Mberu, 2016; Ekane et al, 2016). To the best of my knowledge, the few studies that have tackled waste management policy implementation are mainly focused on other sanitation services like human excreta and water and not necessarily solid waste management (Aryee and Crook, 2003; Thrift, 2007). Though many studies on the challenges of solid waste management in Ghana are available (Asase et al, 2009; Oteng- Ababio, Arguello and Gabbay, 2013; Owusu-Sekyere, Bagah and Quansah, 2015), attention on the role of policy in its successful management has been given little attention.

An assessment of the congruence between solid waste policy and practice has therefore become necessary to help identify factors that have either facilitated or constrained its successful implementation. Furthermore, it will provide stakeholders (National government, local authorities, waste management companies, waste service users, donors, etc.) with the kind of information needed to improve on solid waste practices and policy implementation in order to achieve efficiency, effectiveness and sustainability.

This study aims to contribute to the knowledge of ongoing debate on solid waste policy implementation by assessing the level of congruence between the Environmental Sanitation Policy of Ghana (2010) and the practice of solid waste management using the Ledzokuku Krowor Municipal Assembly as its case study. The extent to which the policy has been implemented and the conditions in place that have influenced its success or failure will also be examined.

1.3 Research Objectives

The main objective of this research is to assess the congruence between the Environmental Sanitation Policy and the practice of solid waste management in the Ledzokuku Krowor Municipal Assembly (LEKMA).

1.3.1 Specific Objectives

1. Identify the goal and objectives of the Environmental Sanitation Policy
2. Critically examine how the Environmental Sanitation Policy has been implemented in LEKMA based on the objectives.
3. Determine the successes and challenges associated with policy and practice in LEKMA.
4. Propose recommendations on how to improve on policy-practice issues of solid waste management.

1.4 Research Questions

The central question the study seeks to answer is ‘*What is the level of congruence between the Environmental Sanitation Policy and practice of solid waste management in LEKMA?*’

To help find answers to the central question of this study, the following sub questions would be interrogated.

1. What are the goals and objectives of the Ghana Environmental Sanitation Policy?
2. How is the Ghana Environmental Sanitation Policy (2010) being implemented in the Ledzokuku Krowor Municipal Assembly?

3. What successes have been achieved and what are the challenges faced in the implementation of the Ghana Environmental Sanitation Policy in Ledzokuku Krowor Municipal Assembly?
4. How can these challenges be overcome?

1.5 Significance of the Study

Implementation of policies and programmes in Ghana has produced varying results and policy on solid waste management is no exception. Achieving the desired results stipulated by the policy is dependent on a number of factors. The findings from this study will provide insight into the complex factors that have either constrained or facilitated the success of the implementation of the Environmental Sanitation Policy in solid waste management.

Furthermore, it will provide stakeholders (National government, local authorities, waste management companies, waste service users, donors, etc.) with the kind of information needed to improve on solid waste practices and policy implementation in order to achieve efficiency, effectiveness and sustainability. Finally, the publication of the findings would be made available, easily accessible and understandable to all stakeholders.

1.6 Scope and Limitation

Accra is made up of sixteen metropolitan, municipal and district assemblies. “The Ledzokuku-Krowor Municipal Assembly was one of the newly created districts in 2007 and was inaugurated on the 29th February, 2008 under the Legislative Instrument, LI 1865 (LEKMA, 2013)”. The choice of this municipality in this study is first of all based on my familiarity with the area having

lived here for over a decade. Secondly, the serious challenge of solid waste management as a result of rapid increase in population which is attributable to rural-urban migration. This has been a serious contributing factor to annual flooding and sanitation related diseases like cholera in the area. Also the availability of time for data collection, access to data and the cost of collecting data influenced the choice of the study area.

According to the policy, solid waste comprises all solid waste materials generated by households, industrial and construction sites (ESP, 2010). Though the Environmental Sanitation Policy outlines ten principal components to be dealt with, the study excludes other types of waste under the policy and focuses on solid waste management because is the most visible and difficult problem city authorities are trying to keep under control. Also, it would have been appropriate to do a survey of the similarity of the Environmental Sanitation Policy with practices in all the Metropolitan, Municipal and District Assemblies (MMDAs) across the country in order to make a conclusive generalization of findings. However, due to time and financial constraints the Ledzokuku Krowor Municipal Assembly has been selected for the purposes of this study. It is believed that some similarities may exist between the selected municipality and other MMDAs and therefore findings and recommendations could be related to other localities.

1.7 Organization of the Study

The study is divided into five chapters. Chapter one gives a general overview of the topic in question, the problem statement, the research questions and objectives, significance of the study and the organization of the study. Chapter Two focuses on the literature review. It elaborates on the theoretical framework and provides an insight into similar studies that have been conducted on

the topic, challenges and recommendations that have been suggested. Chapter Three provides a detailed outline of the methodology used. This includes the Research strategy, data collection: site and sample selection, data collection techniques, framework for data analysis, limitations and potential problems. Chapter Four is the presentation of findings, analysis of data collected from the field and discussion. Chapter Five summarizes findings, provides recommendations and conclusions .



CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter examines the main issues surrounding urbanization, urbanization and solid waste management, other issues related solid waste management in developing countries and Ghana to be specific. The study within this literature review focuses on objective 1 and 2 as stated in subsection 1.3 of the introductory chapter. The remaining objectives will be dealt with in the subsequent chapters. The importance of evaluating the areas of literature mentioned above will be to provide a meaningful discussion and analysis of policy practice in solid waste management in a structured and comprehensible way.

2.1 Urbanization

It is the aspiration of every country to develop and improve with the passing of the years. Along with such growth comes the movement of people from one place to another in search of better opportunities and cities have become the centre of it all. This is best described by the wave of urbanization being experienced globally. Urbanization has been recognized as one of the significant social changes sweeping across the world (Chen, 2007). The United Nations in 2008 reported that about half of the population of the world were living in urban areas and foresee almost every country being urbanized by 2025 (UN-HABITAT, 2008). In spite of the fact that urbanization has gained attention from all quarters, studying it comes with its own difficulties.

One challenge is that every country has its own definition of what urban is and until now there has been no internationally agreed definition of the term. “Several scholars admit that though the world

is becoming urban in nature, the definition of urban itself remains ambiguous, changing with time and space (Tacoli, McGranahan and Satterthwaite, 2015; McGranahan and Satterthwaite, 2014; Voigtlander, Breckenkamp and Razum, 2008; Cohen, 2006; Cohen, 2004)". The most common definitions are by population size or density, administrative or political boundaries, economic status or in some situation a combination of several criteria (Tacoli, McGranahan and Satterthwaite, 2015).

Due to the peculiarity of how every country distinguishes rural from urban, what constitutes an urban area may differ from one country to another. For instance, in Benin, only a locality with 10,000 inhabitants or more qualifies to be classified as urban whereas Angola, Argentina and Ethiopia classify localities with 2000 inhabitant and more as urban (Cohen, 2006). Based on these definitions, an urban area in Argentina would be considered rural in Benin. The absence of a clear and uniform definition of what constitutes an urban area makes it difficult to make comparisons across countries. However, Tacoli, McGranahan and Satterthwaite (2015) concur that generally urban areas are taken to be areas that are more populous and dense than rural areas thereby suitable for locating administrative services.

Similarly, Cohen (2006) discovered that "the reliance on census data and simplified urban projection techniques creates another challenge". Urban analysis requires accurate projections about future urban growths and this in turn is dependent on high quality statistics and a good grasp of current trends and likely projections. "The major source of information on cities has often been obtained from censuses which occur probably once a decade and take years to be analysed and released (Cohen, 2006; Cohen, 2004)". Tacoli, McGranahan and Satterthwaite (2015) further expressed the fear that "even estimates of current projections are sometimes based on data from

outdated sources which create scepticism about claims made”. It is obvious here that claims and projections about urbanization need to be properly scrutinized before drawing conclusions.

Despite the vagaries and uncertainties surrounding urbanization, it is undeniable that the phenomenon is still present. Urbanization has been associated with economic growth. Therefore, as economies grow and prosper, urbanization is inevitable. The obvious question is what then is urbanization? Omoakin (2012) in simple terms referred to urbanization as:

“...the process of increasing agglomeration of people in a human settlement such that the settlement graduates from a particular level of complexity (economic, social, etc.) to another” (Omoakin, 2012).

Demographers have also defined urbanization as the increasing share of the total population living in urban areas (Tacoli, McGranahan and Satterthwaite, 2015; Poston and Bouvier, 2010; Palen, 1997) The above definitions go without saying that urbanization is a process by which society changes from one status to another as the concentration of people within it increases. These changes involve alteration in social, political, cultural, economic and environmental lifestyles of the population.

Urbanization and urban population growth are often conflated to have the same meaning but there is significant distinction between the two. As explained by Tacoli, McGranahan and Satterthwaite (2015), there is no urbanization if both rural and urban populations of a country grow at the same rate. On the other hand, if there is no population growth but the urban share keeps increasing, then, all urban population growth can be attributed to urbanization. Primarily, urbanization is as a result of net migration while urban population growth is dominantly as a result of natural population increase (Tacoli, McGranahan and Satterthwaite, 2015; Voigtlander, Breckenkamp and Razum,

2008; Cohen, 2006). Nonetheless, migration solely does not account for urbanization. Creation of new urban centres and the expansion of urban boundaries as well as natural population growth can also be considered as factors that promote urbanization (Tacoli, McGranahan and Satterthwaite, 2015).

All over the world, populations of countries keep experiencing demographic changes. The world population which stood at 2.5 billion in 1950, reached 6.1 billion in 2000 and it is expected to escalate to about 7.5 billion in 2020 (Omoakin, 2012; Bongaarts, 2001). Interestingly, this foreseen growth is expected to occur in cities of the developing world of which Africa is no exception. Africa and Asia though considered to be the least urbanized in the world, are commonly acclaimed in literature as having the highest urban population growth (McGranahan and Satterthwaite, 2014; Omoakin, 2012). The urban population projection of the United Nations for 2010-2050 predicts that while urban population is expected to decline in developed countries, an additional 944 million and 1449 million urban dwellers are expected in Africa and Asia respectively (United Nations Population Division, 2014).

It is worth noting that though urbanization is on the rise, there are significant diversities among countries and across regions. Cohen (2004) indicates that “there are enormous differences in the pattern of urbanization between regions and even greater variation in the level and speed with which individual countries and cities within regions are growing”. Seto et al supports this assertion and adds that it is important to recognize that there is no “single transition”. The experiences of every country or city may have their peculiar circumstances. According to Voigtlander, Breckenkamp and Razum (2008), urbanization in developed countries could be attributed to rural-

urban migration resulting from the agrarian- industrial revolution whereas that of developing countries like Africa was neither characterized by significant change in the agrarian lifestyle nor the need for industrial workers in the cities.

Research has revealed that as at 1950, the Sub-Saharan region could only boast of three cities that had more than half a million people and by 1980, the number had increased to twenty-nine (Omoakin, 2013; Palen 1987). Today, the African continent has seven megacities (cities with over 10 million population): Cairo, Kinshasa, Lagos, Accra, Johannesburg-Pretoria, Khartoum and Nairobi and in the next 15 years, more are expected to be added (Gunalp et al., 2015). A number of studies agree that the dominant factor in the increase in many African countries' urban population is natural increase rather than migration as is the case with other continents (UN, 2014; Omoakin, 2013; Potts, 2012). Projections are that by 2050, the total African population would be about 2.5 billion and with about 55% residing in urban areas and most of this increase is taking place in small and medium sized cities in the mid-latitudinal Africa (Lwasa, 2014; UN-HABITAT, 2011).

A feature that is common with Africa's urbanization is the high degree of what literature describes as 'urban primacy' (Gunalp et al., 2017; Redman and Jones, 2005). Everything from population to political power is concentrated in one city, often the capital. With these primate cities serving as the nexus for most commercial and economic activities, a great number of people thirsty for perceived better opportunities are drawn into them. According to UN (2014), urban living is often associated with better economic, social, political and cultural opportunities. However, rapid and unplanned growth as well as urban expansion threatens sustainable development where the right infrastructure is unavailable or policies are not well implemented.

Urbanization is predicted to continue in the coming years and therefore raises concerns about sustainable development challenges particularly for lower-middle income countries (UN, 2014). Redman and Jones (2005) rightly comment that ‘nowhere are the opportunities more promising and the challenges more daunting than in the rapidly urbanizing regions of the world’. These ‘transforming regions’ as they describe represent the economic growth engines of developing countries and everywhere would continue to be centres of innovation, culture and arts. They however caution that these same cities are the loci of increasing poverty, pollution, diseases and political instability.

Undeniably, solid waste is one of the unpleasant challenges of urban living. A problem which is as a result of changing consumption patterns and an improved lifestyle. According to Kyte (2012) *“solid waste management is the one thing just about every city government provides for its residents. While service levels, environmental impacts and costs vary dramatically, solid waste management is arguably the most important municipal service and serves as a prerequisite for other municipal actions”*. This implies that the importance of managing solid waste properly cannot be overemphasized. If managed effectively and efficiently by city authorities, the tendency to succeed with the provision of other municipal services is high.

2.2 The Concept of Solid Waste

The term waste has become so common that we tend to overlook what it actually means. Getting a clearer meaning from past research reveals a very dynamic and relative concept. Its definition is dependent on who is looking at it and what it means at that point in time. According to the

European Chemical Industry Council (CEFIC), the nature of a material does not determine whether it is waste or not but rather the attitude or motive of the holder. Therefore, it is those materials that the holder intends to discard or dispose that can be termed as waste (CEFIC, 1995). Similarly, the Basel Convention has defined waste as a substance or an object which is disposed of or intended to be disposed or is required to be disposed of by the provision of national laws . A number of authors go further to describe it as materials that are not prime products for which the initial user has no further use in terms of his/her own purposes of production, transformation or consumption of which he/she wants to dispose (UNEP, 2005; European Union, 2005; OECD, 2005 cited in Otchere et al, 2015). The use of ‘dispose’ in these definitions of waste gives the impression of materials that are completely useless and unnecessary and therefore the need to be thrown away at all cost. In recent times, that notion of waste been completely useless is gradually fading out. The fact that the initial user has no use of it does not rule out its usefulness. This comprehensive definition by the Environmental Protection Act (1993) of South Australia which explains waste to encompass “any discarded, rejected, abandoned, unwanted or surplus matter whether or not intended for sale or recycling, reprocessing, recovery or purification by a separate operation from that which produced the matter; or anything declared by regulation or an environmental protection policy to be waste; whether of value or not” provides a much broader scope to depict that waste can possess some worth in certain situations. Waste may be unwanted but not valueless.

For any country to be able to develop an appropriate method of managing its waste and maximizing its benefits, it is necessary to classify the types of waste produced by its citizens. The classification of waste is determined mainly by its physical appearance, source and the level of risk it exposes to the environment. The classification of waste by its physical appearance separates waste into solid, liquid and gas. Its sources can be categorized into household waste, construction and

demolition, agricultural and industrial waste. The risk it poses to the environment makes waste either hazardous or non-hazardous (Otchere et al, 2015; Dery, 2014). This study focuses on solid waste since it has been identified as the major waste challenge faced by developing countries.

2. 3. 1 Solid waste

As human societies began to advance, the types of waste generated from their activities also became more sophisticated. Most waste produced initially was bio-degradable with time unlike those produced now. The most difficult ones that city authorities have had to deal with is solid waste due to its heterogeneous nature. The World Health Organization (1971) suggests one of the earliest definitions of solid waste as waste arising from the activities of man which is not free flowing. This means that if not properly managed, such waste can stay in the same position and be a nuisance to the environment over a long period of time. Furthermore, both Cointreau (1982) and Sinha (1997) gave a breakdown of its composition and sources by defining it as organic or inorganic (heterogeneous) waste produced from households, commercial and industrial activities which is of no use to the initial holders or producers. “The term solid waste is all-inclusive, encompassing the heterogeneous mass of throwaways from the urban community as well as the more homogeneous accumulation of agricultural, industrial, and mineral wastes (Agwu, 2012; Opara, 2009; Williams, 2005; Tadesse, 2004; Allaby, 1988)”. For the purposes of this study, solid waste is operationalized to mean discarded materials or substances that are not liquid and are a nuisance to the society or the environment.

The classification of solid waste can be done in different ways. Based on its origin it can be classified as industrial, medical and Municipal Solid Waste (MSW). Traditionally, waste management has been regarded as the responsibility of local authorities. They are responsible for

the collection, transportation and final disposal of waste generated within the local areas. Thus, the term Municipal Solid Waste has been used to generally describe solid waste generated within the municipality and collected by or on behalf of the municipal authority (EEA Report, 2013). Authorities do not agree on a single definition, as what is considered MSW differs from country to country. However, it has been widely agreed that MSW consist of waste emanating mainly from residential, commercial and institutional activities (Tonges and Greene, 2012; Periathamby, 2011). These consist of food waste, rubbish, street sweepings, and non-hazardous waste from commercial and institutional activities. Though faecal materials or waste water and industrial waste are excluded from the definition of MSW in both developing and industrial countries, it has in recent times been found to be part of waste disposed of at landfills (UNEP, 2013; Periathamby, 2011). The newest and complex hazardous addition to these components is what has been termed as electronic waste (e-waste) which poses serious risk to human health and the environment. “Ozone-depleting substances released from discarded electronic appliances and building materials (e.g. foams), as well as industrial waste practices contribute to ozone-layer depletion (UNEP, 2011). There are concerns over medical consequences from landfill sites and older incinerators, including cancer, mortality, birth defects and low birth weight (WHO, 2007)”.

2.3 The Link between Urbanization and Solid Waste Management

“Urbanization as described by Pravitasari (2015) is a process of relative growth of a country’s urban population followed by an even faster increase in the political, economic and cultural importance of cities as compared to their rural counterparts. It is linked with an increase in per capita energy and resource consumption and extensive landscape modification (McDonnell and Pickett). Pravitasari (2015) identified that there is a worldwide trend towards urbanization which

in most countries it is a natural consequence and stimulus of economic development based on industrialization and post industrialization”.

The UN (2014) acknowledges that urban living is often associated with higher levels of literacy and education, better health conditions, greater access to social and economic services and enhanced opportunities for cultural and political participation . Isife and Ugwuanyi (2012) believe that these advantages stem from government policies often favouring urban areas over their rural counterparts. Based on their work “Urbanisation and Solid Waste Management Challenges in Nigeria”, they assert that developing countries commonly spend most their budget on improving urban centres especially where their leaders reside even though only a small fraction of the population directly benefits from them (Isife and Ugwuanyi, 2012). The seemingly glamorous and improved lifestyle that cities project serves as the magnetic force that draws people into them.

In 2002, it was estimated that the 2.9 billion urban residents of the world produced on a daily basis 0.64kg waste per person. A decade from then, the number had risen to 3billion people producing about 1.2kg per person of MSW on a daily basis. Alarminglly, these figures are expected to sky rocket in the coming years. By 2025, urban residents are expected to increase to about 4.3billion and would be producing waste of about 1.42kg per person daily (Hoornweg and Bhada-Tata, 2012).

Literature has established the fact that urbanization and economic development are inextricably linked with solid waste generation (Vij, 2012; Hoornweg and Bhada-Tata, 2012; Achankeng, 2003). It is impossible to have people concentrated in a place without waste being generated. Therefore, the higher the concentration, the more waste generated. In their report, ‘What A Waste’

(2012), Hoornweg and Bhada-Tata examined the relationships between growing populations worldwide and the waste generated. They posit that as living standards and disposable incomes of the population increases, so does the consumption of goods and services which results in the high generation of waste. According to them, especially for developing countries, solid waste management which is always the responsibility of local government also makes up their single largest budget item. Furthermore, solid waste is one of the most pernicious and visible pollutants which if not properly dealt with contributes significantly to local flooding and other health problems.

Urban areas in both developed and developing countries face similar challenges in dealing with population concentration. High waste generation in urban areas is not peculiar to only developing countries. The differentiating factor is how the waste is managed. Hezri (2010) expatiates that high income countries generally generate more waste, recycle more and have the resources to invest in advanced technologies for treating their waste. On the contrary, low income countries due globalization generate similar waste as higher income countries but are resource - handicapped in properly managing it. Similarly, other researchers mention that waste management in developed cities is currently focused on optimizing strategies for resource conservation while in developing countries like Ghana, waste management is often underdeveloped, operationally inefficient and inadequately managed with limited expertise and knowledge (Guerrero et al., 2013; Badgie et al., 2012; Wilson, 2007; McDonough et al. 2003). Hoornweg and Bhada-Tata (2012) mention that as solid waste composition get sophisticated, municipal authorities need to upgrade their capacity and expertise in order to meet the challenge.

2.4 Challenges of Municipal Solid Waste Management in Developing Countries

Waste management has escalated into a matter of global concern as a result of economic development coupled with rapid urbanization and the population boom in most cities around the world. As revenues increase, it is followed by the increase in consumption as well as waste generation. In developing countries, the waste generation rate ranges between 0.4 and 1.1 kg per day reaching in some urban areas 2.4kg and more in tourist areas (Le Courtois, 2012). The greatest challenge city authorities are now faced with is how to manage the resultant waste generated from the high consumption rate and changing lifestyles of this enormous population in order to avoid the outbreak of epidemics and provide a safe environment. Municipal Solid Waste management varies from country to country depending on the financial strength and availability of human and other important resources. Though there has been improvement over the years in how solid waste is managed in developing countries, there is still more to be desired as compared to their counterparts in the developed world.

In his article “Solid Waste Management”, Periathamby (2011) suggests six challenges that affect solid waste management. These are inadequate waste collection systems, poor recycling rate, poor treatment or no treatment, uncontrolled disposal, inadequate technology and low awareness of health risks . These challenges are more prevalent in low and middle income countries where rural-urban migration is uncontrolled, rapid urbanization lacks proper planning and industrialization without infrastructure . Most of the available literature has reiterated these challenges and suggested that effective solid waste management is affected by factors that provide the enabling environment for the system to successfully thrive. These factors are political, socio-cultural, institutional, technical, environmental, financial and legal (Guerrero et al, 2013; Oteng – Ababio, 2013; UN-HABITAT, 2010).

2.4.1. Technical Factors

“A number of studies assert that technical factors that influence solid waste management can be associated with lack of technical skills among personnel of the local authority, deficient infrastructure, poor roads and vehicles, insufficient technologies and reliable data (Guerrero et al, 2013)”. The failure of municipal authorities to attract qualified personnel for waste management aspects such as planning, operations and monitoring has encouraged the improper disposal of waste in most developing countries (Onibokun, 2009). As observed by Ogawa (1997), external support given developing countries over the years for solid waste management, have been unsustainable due to the lack of technical expertise at the local level to successfully manage projects initiated. Moreover, he also noted that the lack of research and development has also led to the selection of projects that do not fit the local context, thus, making them useless to the communities with time. Kirondi (2011) discovered that in Uganda and Dares Salaam, solid waste management projects failed because the municipalities lacked trained personnel with managerial and technical skills. Also, due to the unattractive salaries, lack of respect and stigma attached to waste workers, the authorities did not just lack trained professionals but also failed to attract labourers despite the high unemployment rate.

In another study undertaken in five local assemblies in Kenya to assess the challenges of solid waste management, Henry et al (2006) identified that the capacity of the local authorities to provide proper management services had declined because of their inability to keep all their waste trucks operational. It is not uncommon to find the same situation in other developing countries as many have imported vehicles whose spare parts are unavailable and also unsuitably designed for the waste content in their terrain (Coffey and Coad, 2010; Scheinberg et al, 2010; Wilson et al, 2012). A survey of the road infrastructure in the same study revealed that most dumpsites were not served

by easily accessible roads making movement difficult especially in the rainy season. Local authorities however concentrated collection of waste in the central business district and affluent communities where good roads made their movement much easier. This explained the disposal of waste on road curbs and unapproved areas in most of the suburban areas and the accumulation of waste over long periods without collection.

Similarly, in Asia, according to Hamzra and Goel (2006), most of the vehicles used for the transportation of waste in a city like Kolkata were very old. This caused an increase in operational and maintenance cost, reduced efficiency and heightened noise and air pollution. This indicates that the waste sector in most developing countries were not only faced with the difficulty of attracting the right personnel but also lacked the maintenance culture to keep the system functional. In Nigeria, Ogwueleka (2009) found that the collection vehicles were in a state of disrepair in most cities, there was inadequate service coverage in most urban areas and in rural areas there was no collection at all. Rural dwellers had no access to waste collection service. They were left with no option than to dump waste at any vacant plot, public space, and river or burn it in their backyard, thereby polluting the air.

2.4.2 Financial Factors

One of the major challenges attributed to the failure of municipal authorities in managing solid waste is access to financial support as low priority is provided to services in this respect. A proper solid waste management system requires huge monetary investment to sustain it. Bello et al (2016) acknowledge that it goes a long way to assist municipalities that are usually ill-equipped to deal with prompt collection and disposal of waste. However, the absence of financial support, the

unwillingness of users to pay for the service and the improper use of economic instruments have hampered the provision of satisfactory solid waste management services (Sujauddin et al, 2008).

Ogawa (1997) agrees that the problem is acute at the local government level where the taxation system is not well developed and the financial basis for such municipal services such as solid waste management is weak. He further states that the problem of limited finances is worsened by lack of financial management to properly utilize the available resources for maximum benefit. For instance, as identified in the case of Keko Machungwa (an informal settlement in Tanzania), the local authority was not only financially constrained by the unwillingness of the local people to pay charges despite reductions but the authority's own lack of priority setting led to the inappropriate use of funds (Kisala, 2014). One significant avenue of mismanagement of funds identified in literature is the importation of technologies that are unsuitable for the waste terrain of developing countries. Local authorities end up wasting resources on sophisticated equipment which break down in a short time because they are being used to handle waste characteristics they were not designed for (Henry et al, 2006; Memon, 2010; Zurbruegg, 2003).

Ogwueleka (2009) in his study of Nigeria also found that proper waste collection and disposal was affected by lack of morale on the part of personnel. They failed to work due to poor remuneration or delays in payment of salaries. Also, the wrong siting, design and maintenance of disposal and landfill sites increased the cost of transfer and disposal which in turn increases the financial burden on users.

According to USAID, "it is common for municipalities in developing countries to spend 20 – 50 percent of their available budget on solid waste management, which often can only stretch to serve less than 50 percent of the population (Memon, 2010)". Public sector inefficiencies and continuously increasing cost has led local authorities and some researchers to admit that the

involvement of the private sector could help boost service delivery. (El Fadel and Massoud, 2012; Sharholy et al, 2008).

According to Ahmed and Ali (2006), “a partnership between the private and public sectors would combine the flexibility and dynamism of the private sector with the public sector’s custodianship of public interest”. This would promote more efficiency and effectiveness in the provision of waste services. Nonetheless, financial aspects of this partnership with respect to budgeting, cost accounting, financial monitoring and evaluation must be taken into consideration with the aim of recovering enough money to cover the recurrent operational expenditure as well as to stock up capital for new investment or large maintenance. (Malenya, 2015; Lohri et al, 2014; Wilson, 2012).

2.4.3 Institutional Factors

Institutional systems provide a framework for better social order in a community as well as public policy formulation and implementation process. They are also requisite for legitimizing policies, social values and actors embodied in resource development and utilization, economic programs, governance practices and promoting specific cultural heritage (URCRD Kenya, 2010) . According to Schubeler (1996), “a clear definition of roles and responsibilities for institutions and government agencies is an essential requirement for solid waste management to avoid controversies, inaction and the instability of the political system”. In many developing countries, it is not unusual to find various agencies involved in the management of solid waste and other municipal services. There is however, no clear demarcation of their roles or functions and no single agency in charge to coordinate their activities and projects. The lack of coordination among the relevant agencies often results in different agencies becoming the national counterparts to different external agencies for solid waste management projects without knowing what other agencies are doing (Ogawa, 1997) .

This leads to duplication of efforts, waste of already limited resources and unsustainability of projects. There seems to be a general consensus among researchers that weak institutions are the major causes of Solid Waste Management (SWM) failures in developing countries like Africa, Latin America and Asia. Local authorities usually lack the necessary organizational capacities (leadership) and professionalism to properly run solid waste management activities (Chang and Lo, 2008; Wilson, 2007). Most literature agree that the low status situation of waste workers and the low priority given by politicians to solid waste management as compared to other municipal activities, have resulted in the high numbers of unskilled personnel within the local waste institutions and the lack of motivation for waste collection (Vidanaarachi et al, 2006; Moghadam et al, 2009; Sharholy et al, 2008). One study done in Kenya showed that the low priority given to municipal solid waste was as a result of political pluralism. Local councillors were politically affiliated and made decisions that suited their individual parties instead of the interest of the local people. The local authorities had an inflated workforce full of redundant people who were kept for political reasons. This depletes the already limited resources in the form wages leaving very little for other municipal activities (Henry et al, 2006). Inefficient institutions as the UN HABITAT (2014) rightly posits have adverse effects especially on environmental service delivery and are a setback to a nation's development.

2.4.4 Environmental Factors

Solid waste management, especially in large cities, is a significant environmental challenge. Energy generation, composting, separation and recycling which are capable of converting waste into a valuable asset are to be desired in order to meet the current international trends. "To attain this, a number a hurdles like changing the current method of collection and disposal need to be

overcomed (Simelane and Mohee, 2015)”. In developing countries, open dumpsites is the most common method of disposing waste (Hoornweg and Bhada-Tata, 2012). Dumping of mixed waste occurs alongside open burning, grazing of stray animals and pollution of surface and groundwater by hazardous substances such as leachate and gas (UNEP, 2011) . “Dumpsites have been linked to many harmful health effects, including skin and eye infections, respiratory problems, vector-borne diseases such as diarrhoea, dysentery, typhoid, hepatitis, cholera, malaria and yellow fever, high blood lead levels and exposure to heavy-metal poisoning (UNEP, 2011)”. The negative effects associated with dumpsites have caused the decline in value of properties close to them (Momodu et al, 2011, Awosusi, 2010). Sanitary landfilling with gas and leachate collection, according to Chatterjee (2010) is the recommended method of municipal solid waste disposal but this nonetheless is absent in a lot of developing countries. Best management practice requires that waste must have undergone sorting, material and energy recovery, and treatment before disposal. This will help to minimize environmental impact and the amount of waste to be disposed, conserve resources and protect public health. The first step toward proper waste disposal is efficient collection of waste. Poor waste collection necessitates littering and indiscriminate dumping . “The lack of environmental controls and assessment of real impacts have been suggested to be some of the factors that are affecting the environmental aspects of solid waste management (Asaase et al, 2009; Matete and Trois, 2008)”. Owusu-Sekyere et al (2015) confirmed this assertion in their study which revealed that “final disposal sites in Ghana are often located in ecologically or hydrological sensitive areas”. The maintenance of these disposal sites are often below the legally set standards for ensuring public health and environmental quality, thus exposing residents to all sort of hazards. “According to the study, residents close to disposal sites like Oblojo and Dompase (in Accra and Kumasi respectively) have often threatened to forcefully shut down the facilities because of the

unbearable stench, mosquitoes and other insects they have been exposed to. The public acceptance of such facilities in neighbourhoods has declined as a result of this attitude of poor maintenance by municipal authorities and the fear of being exposed to environmental hazards”.

In identifying the status, problems and challenges of municipal solid waste, Zhang et al (2010) acknowledged that for China, the Ministry of Construction had developed a comprehensive technical municipal solid waste landfill standard. However, in reality these standards are not adhered to and good landfill practices were not well understood. At the time of the study, housing around the dumpsite was increasing and the environmental hazards associated with these dumpsites posing serious health hazards to the population. Their projection for the years ahead was a further deterioration of the disposal situation as China continues to experience rapid urbanization.

Likewise, in Kenya, it was discovered from a study of a number of local authorities that convenience or proximity rather than environmental safety was a high consideration for the siting of dumps. These dumps were not environmentally assessed to check the level of pollution exposed to the vicinities. Therefore, a number of surface and ground water had been contaminated by leachate seeping into them from MSW. A typical example is the contamination of the Nairobi Dam which was supposed to a source of portable water to its surrounding environs. The most alarming finding made in the study was the fact that despite the contamination of the Dam water, some farmers still used it to irrigate their crops posing a serious health risk to the very generators of the waste (Henry et al, 2006).

2.4.5 Political Factors (Policy and governance issues)

All over the world, the management of the environment is a serious politically related issue. Varying interests compete for the most advantageous locations, ownership or use of resource,

waste sinks and for publicly provided infrastructure and services. “In the process of these conflicts, if good environmental management is not adhered to, valuable natural resources are lost (Hardoly et al, 2001; Konteh, 2009)”. Politics inevitably plays an important role in the management of municipal solid waste. “The structure, functioning and governance of the solid waste management systems are affected by the relationship between central and local governments, the role of party politics in local government administration and the extent that citizens participate democratically in the policy making process (Schubeler, 1996)”. A typical example is found in Kenya where political jostling has been a contributing factor to the failure of municipal authorities carrying out their duties efficiently and effectively. The political affiliation of local authority councillors forced them to project party interest instead of the good of the whole. Projects to upgrade slums and the retrenchment of over inflated workforce within the local authority were shelved for political reasons (Henry et al, 2006). Political interferences such as these are a major impediment to the delivery of satisfactory solid waste management service to citizens in most developing countries especially in Africa.

Research has also shown that the process of policy making has significant effects on the outcomes of its implementation. A public process of SWM goal formulation that is democratic and aimed at identifying the actual needs of the citizens is therefore very important to ensure that limited municipal resources are used judiciously to provide an equitable and efficient service. Policy failure in developing countries is usually as a result of inadequate formulation and implementation of unrealistic policies that are detached from local needs (Konteh, 2009). Most low and middle income countries lack proper governance institutions typically found in high income countries such as public policy research institutions, freedom of information laws, autonomous judiciary and many more (Bhuiyan, 2010). As Konteh (2009) opines, striking the balance between policy,

governance, institutional mechanisms and the resource provision as well as allocation is the daunting challenge for most low-income countries (Konteh, 2009 cited in Marshall and Farahbakhsh, 2013).

Furthermore, solid waste management in most situations is not an issue of high priority for local and national policy planners. Other municipal issues are given importance and surplus budget is left to deal with waste issues (Memon, 2010; Yousif and Scott 2007). “According to Yousif and Scott (2007), countries such as Guatemala have serious solid waste management project continuity problems as all municipal workers; either involved in elections or not are replaced after any change of government”. “The lack of long term commitment results in the abandonment of projects started by previous governments (Zarate et al, 2008)”.

In Nigeria, as Ogwueleka (2009) found, “the local authority had to consistently deal with striking waste workers over unpaid salaries as a result of delays in the approval of budgets by the parent ministry. In some cities in the same country, waste revenues are simply rolled into the general treasury instead of returning to waste related operations and local authorities are forced to go through a cumbersome procedure to get their monies back”.

Additionally, millions of displaced people forced to seek refuge in urban cities as a result of conflicts and political unrest continue to be a growing contributing factor to the problem of solid waste management in some developing countries such as Somalia, Cote D’Ivoire and Sudan (Boadi et al, 2005; Konteh, 2009, African Review Report, 2009). These conflicts disrupt waste management systems and provide the conducive environment for the trafficking of illegal trans-boundary hazardous waste. Cote D’Ivoire experienced this in 2006, when illegal waste from Estonia and the Netherlands were dumped in the country (African Review Report, 2009). Local and national governments have also been accused of under prioritizing solid waste management

and allocating more resources to other social and political issues to the detriment of waste matters (Memon, 2010; Yousif and Scott, 2007).

2.5 Urbanization and Challenges of Solid Waste Management in Ghana

Africa is considered one of the least urbanized continents in the world but has the fastest growing urban population as compared to the rest of the world. Contrary to urbanization trends elsewhere, the population is growing in the absence of economic development (Songsore, 2008). Africa's urbanization has therefore been described as 'demographic urbanization' rather than 'economic urbanization' because it is not propelled by radical changes in agricultural productivity and industrialization (Songsore, 2008; 2003a; Clark 1999). Urbanization in Ghana is no different from the trends in other African countries. Yankson and Bertrand (2012) mention that since the middle of the twentieth century, Ghana has experienced rapid urban growth. There has been a rapid increment in the proportion of people living in urban areas (defined in Ghana as any settlement with at least 5000 people). Interestingly, the urban population concentration is around Accra, Kumasi and a few cities. *

In demographic terms, Accra can be considered as a 'primate city'. This is not only in terms of population but cuts across social, economic and political issues. Since 1877 when the national capital was transferred from Cape Coast to Accra, Accra has enjoyed considerable advantage over other cities in the country (Yankson and Bertrand, 2012; Oteng-Ababio, 2010). The seat of government, government ministries and agencies and almost every administrative service is centred in Accra. After independence, a modernization strategy based on import substitution industrialization further influenced the development of Accra positively. These strategies included the building of the harbour and new township in Tema. Employment opportunities in Accra and

Tema have led to the siting of head offices of major banking, commercial, industrial and other important activities (Yankson and Bertrand, 2012). The drawing of people into these areas has been inevitable and urbanization has brought improvement in certain areas but has also been characterized by the increase of slums, urban poverty and the generation of massive waste.

The experiences of solid waste management in Ghana are no different from those faced by other developing countries around the world. Over the years, local and national authorities have been faced with the daunting challenge of effectively managing solid waste to keep cities clean and improve the health of citizens. The increase in population and rapid urbanization in the urban cities within the country has overwhelmed the capacity of most local authorities to cope with the situation.

“Though the ideal situation for the effective management of solid waste is to practice the entire functional elements (generation, onsite storage, transfer and transport, disposal, processing and recovery of solid waste), currently in Ghana, the concentration is on collection and disposal (Amoah and Kosoe, 2014; Kaseva et al, 2002; Kaseva and Gupta, 1996; Tchobanoglous et al, 1993)”. The three solid waste collection methods practiced in the country are Kerbside, House-to House (HtH) and Communal Collection Centre (CCC). The Kerbside collection system involves the collection of deposited waste on specific days at kerbsides. For house-to house collection, waste collection crews pick up waste from households and in the CCC method, a common container is placed at a designated place where the community empties their waste to be collected by a waste collection vehicle later (Addaney, 2015).

Waste collection and transportation even though expected to be the basic of the waste system elements has proven to be a difficult and disorganized task in the urban areas. It is estimated that in Accra and Kumasi, the two largest capital cities in the country, about 4200 tonnes of waste is

generated daily with collection rate of about 70% (Ghana Statistical Service, 2010). This is inadequate and the glaring evidence of this is seen from streets littered with garbage and indiscriminate dumping of waste at flawed zones (Owusu-Sekyere et al, 2015). It has been identified that the most affected areas are the low income, high density areas where people are unable to afford the payment for regular waste collection while the high and middle income areas enjoy relatively better services as they can afford to pay more (Tsiboe and Marbell, 2004; Obirih-Opare and Post, 2002). The difficulty of providing the quality of service commensurate with the growing population has been characteristically blamed on a number of technical, financial and institutional constraints at various levels of government; local, national and private sectors (Oteng-Ababio, 2013; UN-HABITAT, 2010).

Historically, the provision of sanitation services in Ghana was solely the responsibility of city authorities. However, deficiencies identified in the delivery of their services led to a policy shift in the 1990s towards private sector involvement. The aim of this shift was to harness the strengths of the private sector in order to overcome government failures in the provision of direct public service and improve efficiency in sanitation service delivery. This led to the contracting out of solid waste management services to the private sector which has continued till date (Cointreau-Levine, 1994; Cointreau-Levine and Coad, 2000; Post et al, 2003; Kumasi Metropolitan Assembly, 2010). The rationale of the private sector involvement was a policy initiative from the World Bank to improve efficiency (reduce cost) and effectiveness of service delivery through competition in the market.

With this form of privatisation, private waste companies compete for zonal monopoly to provide services over a period of time and to ensure that integrated aspects of sustainable development are incorporated in solid waste management (World Bank, 1999). The total cost of management under

this system is not put on beneficiaries but rather government subsidizes the cost and allows beneficiaries to pay some percentage (limited polluter pay). The choice of this form of privatisation was based on the idea of the generator bearing a part in the cost of management. According to experts, this system is to caution generators to reduce waste generated and reduce colossal cost of solid waste management expended by government (Sekyere et al, 2015).

Despite the advantages of this change in management, the results expected have still not been achieved. Only about 60-70% of waste generated in the cities are been collected. It has been identified that the problem is not with the initiative but rather instead of the private companies cooperating for the public good, they are interested in their economic gains (Sekyere et al, 2015). Waste Management in Ghana and particularly Accra is not satisfactory. However, from most accounts the involvement of the private sector has helped improve the average daily as well as yearly waste collection (Fobil, 2008; Thompson, 2010).

2.6 Legal Framework and Waste Management Policy in Ghana

In Ghana, general solid waste management is the responsibility of the Ministry of Local Government and Rural Development which supervises the decentralized Municipal, Metropolitan and District Assemblies (MMDAs). Through their Waste Management Departments and Environmental Health Departments, the MMDAs are charged with the responsibility of collection and disposal of solid waste. To ensure that the right environmental standards are adhered to in carrying out these activities, the Environmental Protection Agency was established in 1994 under the auspices of Ministry of Environment and Science and given regulatory authority over solid waste management . The agency later developed the Environmental Protection Agency Act 490 and the Environmental Assessment Regulation LI 1625 as a tool of control to ensure that solid

waste disposal is done in accordance with standards and procedures of the EPA and any other regulatory body.

Additionally, the Local Government Act (1994), Act 462 and the Environmental Sanitation Policy (1999) were passed to provide the legal and regulatory framework that guides solid waste management. However, due to changing trends globally, the Environmental Sanitation Policy (1999) was revised in 2010. The old sanitation policy was reviewed to reflect the changing context of national and international development priorities (the Ghana Poverty Reduction Strategy, the Millennium Development Goals, and the New Partnership for African Development –NEPAD).

The overall goal of the Environmental Sanitation Policy(ESP) is to develop a clear and nationally accepted vision of environmental sanitation, as an essential social service and a major determinant for improving health and life in Ghana (Environmental Sanitation Policy, 2010)”.In order to achieve the overall goal, the ESP 2010 outlines seven policy focus areas and challenges that need to be addressed and these include: Capacity development, Information, education and communication, Legislation and regulation, Levels of service, Sustainable financing and cost recovery, Research and development, Monitoring and evaluation . There are ten principal components of environmental sanitation in the ESP, 2010; Solid, Liquid and Gaseous waste management, Storm water drainage, Public cleansing, Control of pests and vectors of disease, Food hygiene, Environmental sanitation education, Inspection and enforcement of sanitary regulations, Disposal of the dead, Control of rearing and straying of animals and Monitoring the observance of environmental standards (Environmental Sanitation Policy, 2010).

Generally, the Environmental Sanitation Policy Co-ordination Council is responsible for coordinating the policy and ensuring effective communication and cooperation between the many

different agencies involved environmental management in their respective localities (MLGRD, 2004). Aside the Environmental Sanitation Policy, other guidelines used by the MMDAs with regard to disposal of solid wastes are the Ghana Landfill Guidelines, Guidelines for the Management of Healthcare and Veterinary Waste in Ghana and Manual for the Preparation of District Waste Plans in Ghana.

From the above, it is obvious that there exist numerous policies and regulations concerning waste management. It has been a matter of concern for many governments and various attempts have been made to deal with the problem. Though significant progress has been made since the inception of solid waste management in Ghana, there is still more to be desired as progress is slow and filth continues to engulf our cities.

As identified in the numerous literature reviewed above, most municipal authorities in developing countries are challenged technically, financially, politically and socially. This inhibits their abilities to provide the best waste management solutions suitable for their particular localities. Therefore, as mentioned earlier, proper waste management can only be achieved if careful consideration of its close connection with the state of the society is made. This implies that waste management solutions can only be successful if it is related with the history, economy and culture of the society. A simple transfer of techniques or solutions from other countries especially developed ones can be disastrous for any developing country. It is against this backdrop that a theoretical framework of waste management that takes a holistic approach is discussed in the next section.

2.7 Theoretical Framework - Integrated Sustainable Waste Management (ISWM)

The current use of the term “Integrated Sustainable” in waste management is as a result of the shift from the narrower perspective of looking at waste management to a much broader and inclusive perspective. Everywhere in the world, there is a growing demand for sustainable and coherent solutions to the waste management problem. It is more serious in developing countries where rapid urbanization, economic growth and industrialization have increased the rate and type of wastes produced making it difficult for both national and local government to deal with it (UNEP, 2009). In problem solving, there is always a high tendency of moving quickly to solutions without really understanding the root cause of the problem and this is very true with the case of solid waste management. The initial management practices were defined in engineering terms, that is, technical problems that needed “technical fixes” which failed to tackle the problem (van de Klundert and Anschutz, 2001).

The concept of Integrated Sustainable Waste Management (ISWM) emerged in the 1990s when most International agencies and NGOs active in developing countries were disenchanted with the exclusively technical approach to waste management (Wilson, 2007). It was first developed by the Dutch NGO called WASTE and further developed by the Collaborative Working Group on Solid Waste Management in Low and Middle income countries (Khatib, 2011; Wilson et al., 2013). This novel approach was to offer an unconventional way of thinking and looking at waste and its management away from the typical technology-centred approach to a holistic and all-inclusive system that leads to sustainability (Wilson et al., 2013). Waste under this concept is seen as both negative and positive material which can be a source of income for people. It also reveals the fact that waste management is made up of complexities and its associated problems have other causal factors other than being only financially or technically related. Some are as a result of managerial

incapabilities, cultural, political, environmental and social issues (van de Klundert and Anschutz, 2001). The concept was therefore aimed at integrating the many processes and elements that make up the waste management system as well as striking a balance between environmental effectiveness, social acceptability and economic affordability (McDougall et al, 2001; van de Klundert and Anschutz, 2001; Thomas and McDougall, 2005). Furthermore, this concept recognizes that no one solution is fit for the conditions prevalent in every country. ISWM systems are therefore tailored to suit specific community goals by incorporating stakeholders' perspectives and need, local context (from the technical such as waste characteristics to the political, cultural, environmental, institutional and social context) and the best combination of the right methods of prevention, reduction, recovery and disposal. ISWM has gradually gained acceptance in the discussion of solid waste management (Kollikkathara et al, 2009; McDougall et al., 2001; van de Klundert and Anschutz, 2001; Wilson et al., 2013).

2.7.1 Dimensions of Integrated Sustainable Waste Management

The concept of ISWM identifies three important dimensions in waste management as shown in figure (1) below. These are; the stakeholders, the elements of the waste system (generation, collection, transportation, transfer and disposal) and the sustainability aspects which if properly merged, can produce the appropriate results.

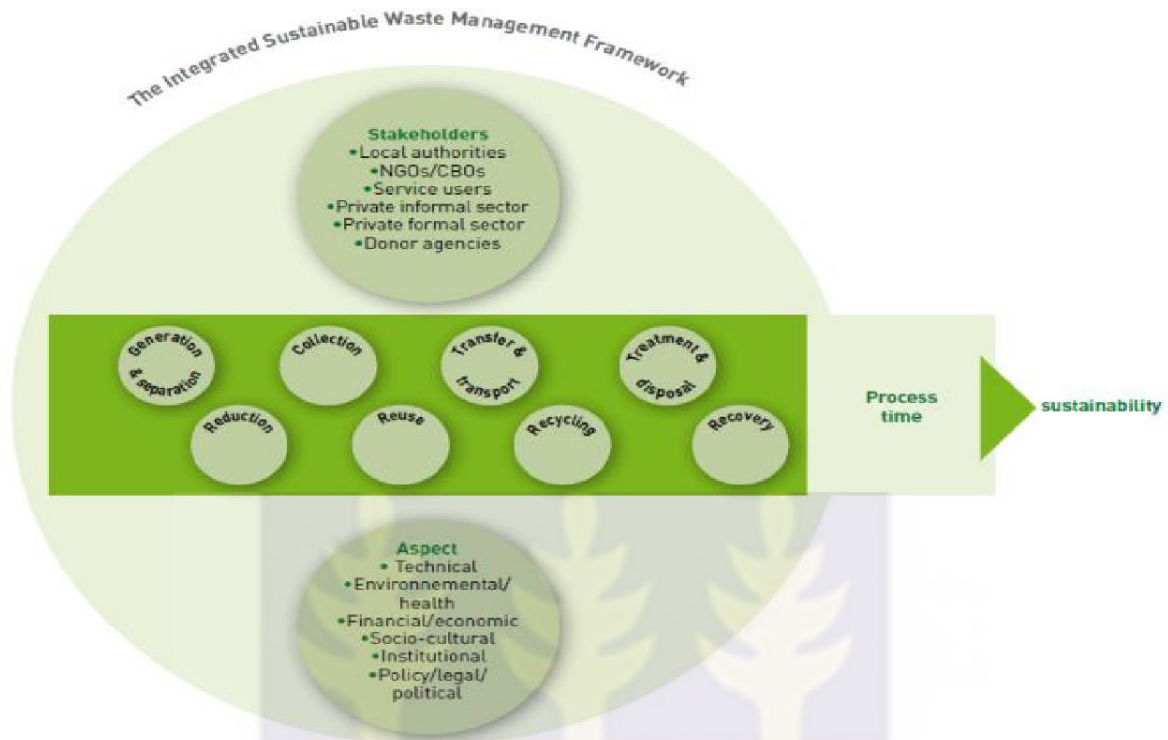


Figure 1: The original ISWM model developed by WASTE (2001)

Source: van Klundert and Anschutz (2001)

The stakeholders in this context are all individuals or organizations that have an interest in waste management. These could be waste generators, manufacturers, municipal authorities, service providers, NGOs, international organizations and many more. These stakeholders have various interests and their influence on the system varies. To ensure that the waste system works effectively, it is important to get the stakeholders to cooperate on achieving a common interest (van de Klundert and Anschutz, 2001).

The elements of the waste system refer to the process waste goes through from its storage to its final disposal. Under ISWM, the waste management system is viewed as a combination of several stages in the management of the flow of materials within a city or region. Elements such as

collection, transfer, disposal or treatment are recognized as the main elements of the system. Also waste prevention, minimization, recycling, reuse and other forms of recovery are given priority by the system. According to van de Klundert and Anschutz (2001), the history and character of the locality has an influence on elements that are present and those that are under developed. The incorporation of ISWM is to supplement the existing system so that all elements are represented.

The third dimension of the concept refers to the sustainability aspects. These are the lenses or aspect through which the existing waste management system is analysed in order to come up with new strategies. The ISWM concept distinguishes between six aspects or lenses through which waste management can be assessed. In order for the waste system to be expanded or changed, consideration should be given to the political, environmental, socio-cultural, financial-economical, institutional and technical aspects (van de Klundert and Anschutz, 2001). All three dimensions are interrelated and their linkages ensure that the system properly functions (Khatib, 2011).

This new concept can be said to possess many advantages, however, an adoption of the concept in practice comes with its own peculiar challenges.

First of all, ISWM does not define a 'best' system because there is no such thing as a universal best system. The model in reality is just a theoretical framework from which systems can be designed and implemented and existing one optimized (McDougall et al., 2001; UNEP, 1996). McDougall et al. (2001) argue that the integrated nature of ISWM creates a host of variables that can pull a system in different directions and for that reason there will always be trade-offs. It is not possible for any system design to achieve either economic or environmental sustainability because this is a total quality objective and it can never be reached. This is because reducing environmental

impacts further will always be possible but will lead to continual improvements (McDougall et al., 2001; Marshall and Farahbakhsh, 2013).

Also, many studies acknowledge that waste systems that ignore social components and priorities are bound for failure (Dijkema et al., 2000; Petts, 2000; Morrissey and Browne, 2004, Henry et al., 2006). Key elements to the success of any waste program are public participation and empowerment, decision transparency, networking, cooperation and collective action, communication and accessibility of information (Carabias et al., 1999; Zarate et al., 2008). Nonetheless, since citizens did not shape the solid waste management system they utilize, it is difficult to fully integrate stakeholders and ensure public involvement. Most of the systems in use were shaped by technically minded ‘experts’ who designed the system in engineering terms.

2.8 Conclusion

This chapter discussed issues from related literature on urbanization, urbanization and solid waste management, challenges of solid waste management in developing countries as well as reviewed policies that have guided solid waste management in Ghana. Also, the theoretical framework on which the study is based was also analysed.

CHAPTER THREE

RESEARCH METHODS

3.0 Introduction

The research study sought to achieve a number of inter related objectives set within the context of policy and practice in solid waste management. These were:

1. Identify the goals of the Environmental Sanitation Policy
2. Explore the factors that facilitate or constrain policy congruence with solid waste management practice.
3. Critically examine how the Environmental Sanitation Policy has been implemented in LEKMA.
4. Determine the successes and challenges associated with policy and practice in LEKMA.
5. Propose recommendations how to improve on policy-practice issues of solid waste management.

An important aspect of this research is related to Objective 3 and 4: the opportunity to critically examine how the ESP (2010) has been implemented, its successes and the challenges associated with it. The importance of policy in solid waste management cannot be over emphasized. However, its implementation in practice yields varied results. A chance to gain in depth views from various stakeholders would not only add to the knowledge on solid waste management but provide great insight on sanitation related issues in general.

An important contribution provided by this research was the study and analysis of empirical data on how a local assembly is carrying out the implementation of the Environmental Sanitation Policy (2010), successes chalked, the challenges that confront them and the lessons that can be drawn from the process. In this chapter, details of the research strategy adopted to achieve the research objectives mentioned above, alongside the data collection method, including site and sample selection. Also, the analysis procedure adopted is explained. Furthermore, the limitations and problems with the selected research strategy and its implementation are tackled.

3.1 Research Strategy

According to Biggam (2008), a description of how a research study is to be carried out is known as the research strategy. A research strategy has to be clearly spelt out to give the reader a sense of understanding of how the work will be done and make it easier to be replicated by others. There are different research strategies that can be employed to achieve the objectives of any empirical study and none of them can be labelled as superior to the other. What is most important as Saunders et al (2000) admit is that it is able to help the researcher answer the particular research questions and objectives of the study. Therefore, the choice of a research strategy is influenced by the research questions and objectives, the extent of existing knowledge, the availability of time and other resources, as well as philosophical underpinnings (Saunders et al., 2000).

This empirical study sought to gain in depth knowledge about a contemporary issue within a real life context. The main aim was to assess the congruence of the Environmental Sanitation Policy (2010) with the practice of solid waste management and this can only be done through the collection and analysis of empirical data from various stakeholders. Which research strategy then

can allow for the collection of data on a contemporary issue, from a variety of stakeholders and within a real life situation?

Experimental research strategy though useful in answering “why” or “how” questions is not suitable for this particular study. It is interested in establishing causal links between a dependent and an independent variable and it is done in a laboratory with the aim of establishing objectivity and not in the real context of the subjects (Hakim, 2000; Biggam 2008). Similarly, historical strategy cannot be considered as it is interested in dealing with past phenomena and the focus of this study is on a contemporary issue. Action research could have been suitable for this empirical study as it supports in depth analysis of a current problem and a researcher bringing about change through the close collaboration with the subjects in the problem area (Biggam, 2008). However, due to resource and time constraints, this strategy loses its appeal for this particular study.

This research adopts both qualitative and quantitative stance in achieving its aim of gaining rich insight into the issues surrounding policy and practice in solid waste management. In Denzin and Lincoln’s (1994) assertion, qualitative research involves studying “things in their natural settings attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them”. This process as stated by Biggam (2008), gives the researcher the opportunity to extract “quality” responses from the subjects under study.

Nonetheless, quantitative research which is often used in the natural sciences to explain natural phenomena using methods such as laboratory experiments and mathematical modelling can be employed in the social setting through the use of survey techniques in collaboration with

qualitative methods (Myers 1997; Biggam, 2008). The combination of both methods helps deal with the pitfalls associated with the use of each method separately (Saunders et al, 2012). It also helps this research to gain various insight from the different stakeholders involved in solid waste management within the Local Assembly.

For every research regardless of the methods adopted, Creswell (2013) explains that the researcher brings on board some beliefs and assumptions that influence the study. This has widely been named by various researchers as research philosophies, paradigms or knowledge claims (Lincoln and Guba, 2000; Creswell, 2003; Biggam, 2008). There are a number of philosophies that influence a researcher's decisions such as Positivism, Interpretivism and Pragmatism.

Positivist hold the view that reality is objective and independent of the observer so can be measured and inferences drawn from tested samples. Such researchers would prefer to work with observable social realities in order to make generalization from the sample as done in the physical and natural sciences (Biggam, 2008; Saunders et al, 2009). The researcher is not interested in testing theories and making generalization about the sample population so does not hold a positivist view. Unlike the positivist, Biggam (2008) asserts that an interpretivist believes that the world can be understood through social interactions and it is through these social interactions that meanings are attached to phenomena. Such researchers' intent is to interpret the meaning that other have about the world and therefore tend to make use of qualitative methods. Though this research intends on drawing subjective meanings that various stakeholders attach to solid waste management, it is not restricted to using only qualitative methods to achieve this purpose.

The researcher believes that whatever means can be used to achieve the research objectives should be used. Therefore, the researcher holds a pragmatic philosophy of inquiry. Pragmatists according to Creswell (2003) are more interested in the problem than the methods. The focus is with applications and solution to the problem. They therefore tend to use mixed approaches to understand the problem. Tashakkori and Teddlie (1998) project the understanding that, as a philosophical underpinning for mixed methods, pragmatists focus attention on the research problem in social science research and apply multiple approaches to gain knowledge about the problem. This study is concerned with gaining varied stakeholder views on policy and practice in solid waste management and whatever means possible to achieve this aim is employed. Thus the use of a mixed method instead of either qualitative or quantitative.

Based on the pragmatic view and the mixed method approach of inquiry used by the researcher in this study, the best research strategy adopted to allow the researcher gain an in depth knowledge into the contemporary issue of solid waste management within real life context is the Case Study strategy.

3.1.1 Case Study Research Strategy

As labelled by Cohen and Manion (1995):

“...the case study researcher typically observes the characteristics of an individual unit – a child, a class, a school or a community. The purpose of such observation is to probe deeply and to analyse intensively the multifarious phenomena that constitute the life cycle of the event”

This description of a case study shows that the researcher is interested in observing particular behaviours of research subjects in their real life situation or context. This aspect of case study fits perfectly into this study's quest to probe into how Sanitation Policy has been implemented with regards to solid waste management within a particular local context. Another dimension is introduced in Robson's definition of case study as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence". Similarly, Yin (2003) emphasizes on context as well as the contemporary nature of the phenomena and adds that the boundaries between the phenomenon being studied and the context are not clearly evident.

The emphasis here on the 'contemporary' and 'real life context' distinguishes case study from other strategies mentioned earlier. An experiment for example can be used to study a contemporary phenomenon but within a highly controlled context and not its real life context. Historical studies come closer to case studies but are interested in issues of the dead past and not contemporary issues. Case studies also differ from survey studies in that although the research is undertaken within context, the ability to explore and comprehend this context is limited to the number of variables for which data can be collected (Saunders et al, 2009; Biggam 2008).

Owing to the facts mentioned above, there is no doubt that the case study is the strategy best suited for this particular study. However, the case study strategy has been criticised on a number of issues and has its own peculiar limitations. To start with, most criticisms levelled against the case study has been that it lacks the basis for scientific generalization (Biggam 2008; Saunders et al, 2009; Bell, 2005). The researcher is fully aware of the difficulty to generalise especially in a one case study and in this particular study the selection of one local assembly (LEKMA) to explore the

implementation of sanitation policy. The study is not intended to generalize but rather to shed more light on what is happening in a particular setting as well as add to the existing knowledge on solid waste management and the case study approach facilitates the advancement of this objective.

Despite the awareness of the above criticism, the researcher agrees with Yin (2003) that this criticism against case study is too harsh and that as with other approaches, generalization is normally arrived at through a repetition of the process. Therefore, with repeated case studies generalization could be realized. Besides, the issue of solid waste management is of interest to many people and not just one local assembly. Therefore, on the basis of relatability (Biggam, 2008; Bassey, 1981), the findings from this study may not be generalized but other local assemblies can relate to the issues raised and draw lessons from it.

Another criticism levelled against the use case study is that, it is time consuming and cumbersome. Yin (2003) agrees with this and concludes that it is not an easy option for a researcher. However, considering the philosophical underpinnings of this research which has been clearly explained earlier, the phenomenon under study, the research questions and objectives, the researcher has no choice than to select the case study strategy as it stands out as the best approach to achieve the aims of this research.

3.2 Data Collection Methods

In line with the mixed method approach adopted for the execution of this study, both qualitative and quantitative methods were used to collect data from the field. These methods were in the form of interviews and questionnaire. The sub-sections below explain how each method was undertaken.

3.2.1 Interviews

An interview is a type of qualitative method for data collection that has been described as a ‘conversation with a purpose’ (Cloke et al, 2004). The purpose of interviews is to give insight into people’s experiences and also to enable informants to be active subjects, mediating and negotiating what is told to the interviewer in their own words (Cloke et al., 2004; Silverman, 1993). According to Kitchin and Tate (2013), interviews can be in the form of closed quantitative interviews, structured open-ended interviews, informal conversation interviews and the interview guide approach (semi-structured interview) .

This study made use of the interview guide approach. Thus, the subjects to be covered were specified ahead of time in the form of an interview guide. Kitchin and Tate (2013) explains that this approach allows for free flow of conversation and at the same time ensuring that all relevant topics to the research are covered. There were two categories of informants interviewed for the study and each of them had different set of interview guide. One guide was prepared for an informant from the municipal assembly and another guide for the four private waste collecting companies interviewed.

Interviews have been criticised for being too subjective and prone to bias (Kitchin and Tate, 2013). However, during the interviews I ensured that I remained objective to avoid any biases.

All interviews were conducted by the researcher. A semi-structured interview was used to find out from the municipal waste management officer how the Environmental Sanitation Policy had been implemented, the successes so far as well as the challenges encountered. Before the interview, an introductory letter from the Political Science Department (University of Ghana) was presented to the municipal assembly in order to book an appointment for the interview. I spelt out the type of information I needed and after a meeting with the in-charge, a date was set for the appointment.

During the interview the main subject areas of the research were explored. I used the interview guide throughout the session and asked follow up questions as and when they arose to help get candid explanation on the subject under study .

The private waste management companies were another set of key informants interviewed. In all there were six companies contracted to provide solid waste services and each company was assigned to a zone created by the municipal assembly. These were Zoomlion Ghana, Rural Waste, Asadu Royal Company, Daben Cleansing Services, Ashbod Company and J. Stanley Owusu Company. I interviewed four out of the six because Rural Waste was a subsidiary of Zoomlion and upon several attempts I was unable to make contact with the representative of Ashbod Company. The informants from each of the private waste companies were interviewed in their respective offices and at a convenient time they chose. They were interviewed on the Sanitation Policy, strategies for managing solid waste and the challenges they encountered.

Apart from the interviews, I employed participant observation to get more information about what was happening on the ground and also to verify the information received from the various informants.

3.2.2 Recording of interviews and transcription

During the interviews, the conversations were captured with the aid of my phone recorder. I supported the recording by also capturing some of the reactions in a sketchbook. This allowed me to fully concentrate on the interviews without struggling to get all the words on paper.

One disadvantage of voice recording pointed out by Robinson (1998) is that not everyone likes to be recorded for the fear of it being used as a means of surveillance. Therefore, it prevents people from expressing their true feelings. Owing to this, I sought the permission to record conversations

from all interviewees before the interviews started. I also assured them that it was only for academic purposes and that confidentiality was assured.

After the interviews, they were transcribed by typing responses onto Microsoft Word. The recording allowed me to play the conversations over and over to get any missing points for the study.

3.2.3 Questionnaire

“Questionnaire is an instrument used for data collection that is made up of a carefully structured and ordered set of questions aimed at obtaining the needed information without ambiguity or bias (Johnston 2000b, p.668 in Cloke et al., 2004). With this, every respondent answers the same set of questions in the same way and sequence”. The questionnaire was used to collect data from the households.

The study employed both open-ended and closed-ended questions. A close-ended questionnaire is “a pre-formulated written set of questions to which respondents record their answers...within rather closely defined alternatives” (Sekaran, 2000: 233). On the other hand, the open-ended question does not provide any answers. Therefore, the respondents are free to express themselves fully about the topic under study.

The questionnaires were administered directly by the researcher using the face to face approach. This had the advantage of churning out a high rate of responses. However, the face-to face method also had the disadvantage of respondents not feeling comfortable providing answers that present themselves in an unfavourable manner. This might lead to respondents not providing accurate and honest answers. It also had the disadvantage of interviewer effect with respondents likely to give expected answers .

The questionnaire was used to find out households' knowledge on the Environmental Sanitation Policy, their attitude towards solid waste management, their satisfaction with solid waste services and the challenges they faced. According to Ghana Statistical Service (2010), "a household refers to a person or a group of persons living in the same house or compound and share the same housekeeping arrangements". For the purposes of this study, a household is defined as a person or group of persons living in the same house or compound and share the same waste bin or means of managing solid waste.

3.3 Sampling Technique

One of the essential steps in the research process is sampling. Sampling is necessary as time and resource constraints may not allow for the whole population to be captured in a study.

The Ledzokuku Krowor Municipal Assembly is a merger between Teshie and Nungua towns for effective governance (Ghana Statistical Service, 2014). These two towns were purposefully selected as they reflect the characteristics the researcher was interested in. Nungua as compared to Teshie has a well-planned outlook with middle to high income earners and some low income earners in a few neighbourhoods. Teshie is mainly occupied by low income earners and a few neighbourhoods with medium to high income earners.

For the purposes of the study, one neighbourhood from each of the towns was selected. One in Nungua with medium to high income earners and another in Teshie with low income earners. In all a sample of 100 respondents was selected. Quota sampling was used to select 50 respondents from each town. After which an interval of 5-10 was used to select the households. Starting with the fifth house from the starting point of each neighbourhood, an interval 10 houses counted till the fiftieth house.

3.4 Data Presentation and Analysis

The data obtained from participants using the questionnaires were processed by the application of Statistical Package for Social Sciences (SPSS). The researcher used the SPSS as a tool for generating output for the meaningful analysis of data generated from the survey. The computation of participants' responses were displayed in the form of tables, and percentages in order to make statistical or quantitative meaning from the data. This was made possible with the aid of SPSS as it was also employed to provide statistical evidence to support the study.

The transcribed interviews were presented and analysed together with the output generated from the SPSS. Together, they were placed within a 'content analysis' of literature reviewed and available relevant documents. This is what Horn (2009) describes as Triangulation. This is the combination of quantitative and qualitative data. According to Horn (2009), it allows the researcher to include large amount of textual information and systematically identify its other quantitative properties.

The presentation and data analysis was also situated within the theoretical framework of the Integrated Sustainable Waste Management model.

3.5 Limitations Encountered on the Field

During the interviews, both the Assembly and private waste companies were reluctant in providing documents especially on those related to finances. Also, as a result of the Assemblies poor record keeping information on the amounts of waste generated and collected was difficult to get.

3.6 Ethical Considerations

In every scientific research, it is important for ethical principles to be adhered to. Before the start of the research, permission was sought from the Ledzokuku Krowor Municipal Assembly. A letter was presented to the head of the Waste Management Department and permission was granted me to start the data collection. Also, before administering the questions to the households, permission was sought from them and consent was given before I proceeded.

Participants were informed that participation was voluntary and information was only for academic purposes. Participants who felt uncomfortable were allowed to withdraw. Deception or coercion was not used at any point to gather information. Confidentiality was also maintained as participants were assured of anonymity regarding what they say both in the interview and questionnaires.

3.7 Summary

This chapter has discussed the research strategy used for the study, data collection methods, sampling techniques as well as data presentation and analysis. It has also provided sufficient justification for the appropriateness of each method used.

Furthermore, important areas like the limitations encountered in the field and ethical issues have also been addressed. In summary, this chapter concludes that the research methods adopted was enough to achieve the research aims and objectives.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter presents the background of the study area, a brief summary of the Environmental Sanitation Policy, results, interpretation and discussion of both qualitative and quantitative data gathered from the field. The chapter was presented in relation to the research questions that guided the study.

4.1 Background of the Study Area

Ghana has ten administrative regions with their various capitals and the seat of government is found in Accra which is in the Greater Accra region. Accra has been the centre of attraction with most people migrating from the various regions for different purposes including economic, social, and education. According to Yankson and Gough (1999), “the implementation of the Economic Recovery Programme in the mid-1980s led to some improvements in the Ghanaian economy with Accra becoming an attractive destination for all manner of people in search of economic opportunities”. “Accra witnessed a massive increase in its population as a result, reaching two million people by the year 2000 (Boadi and Kuitunen, 2003)”.

This huge population created a lot of pressure on the existing infrastructure and was also a governance problem. In view of this, Accra was re-demarcated and the Ledzokuku Krowor Assembly carved out of it in 2007. In 2008, 32 new additional districts were inaugurated; amongst them was the Ledzokuku Krowor Municipal Assembly (GSS, 2010). The Ledzokuku Krowor Municipal Assembly shares boundaries with La-Dade-Kotopon Municipal to the west, Tema

Metropolitan Assembly to the east, with Ashaiman Municipal Assembly to the north, and to the south with the Gulf of Guinea.

LEKMA is the merging together of the Teshie and Nungua sub-metros. This was done to promote efficiency in the administrative machinery and also improve the ever pressing demand for amenities and essential services. It has a population of 227,932 which is made up of 109,185 male populations and a female population of 118,747 (GSS, 2010). The population of LEKMA is a mixture of different ethnic groups consisting of 34.7% Akan, 15.6% Ewe, and a majority of 43.5% being Ga-Dangme. The other 6.2% of the population are made up of Guans, Gurma, Mole-Dagbani, Grusi, and Mande .

Due to the massive migration of people into Accra, many people have moved and continue to move into LEKMA. Aside from these movements from Accra, others have moved into the Assembly from the countryside in search of greener pastures. There are 83,009 migrants here out of which 26,621 were born elsewhere in the region (GSS, 2010).

4.1.1 Solid Waste Management in LEKMA

The management of solid waste has created many challenges for several municipalities in Ghana and LEKMA is no exception. Some of the obvious challenges are uncollected solid waste, choked gutters and beaches littered with plastic waste. Due to financial constraints, inadequate equipment and lack of the appropriate technology to effectively management solid waste alone, the municipal assembly has contracted the help of private waste companies to assist in providing solid waste and other sanitation services. Oteng-Ababio (2010) believes that the partnership between the public and private sector can help mobilize enough resources, reduce risk, deliver prompt services to households and help save cost by combining the skills and resources of various players.

Currently, the Assembly has contracted six private waste companies to provide solid waste services. These are Zoomlion Ghana, Rural Waste, Asadu Royal Seed, Ashbod Waste, Daben Cleansing Services and J. Stanley Owusu Company Limited. Based on their capacity, these companies are assigned to different neighbourhoods which are known as zones in the municipality. These areas were zoned by the Assembly and every waste company is expected to work within its jurisdiction. The organization of solid waste within the assembly is done using two main methods. The door to door services and communal waste containers. The door to door service is applicable to high to medium incomes areas that are well laid out. This means that they have accessible roads for solid waste collecting vehicles and well planned housing structures. In such areas solid waste is stored in waste bins either provided by the household or the private waste companies for free. The bins are collected and emptied on an agreed day between the companies and the households. Under this franchise arrangement, service providers are paid directly by the beneficiaries for the service. However, the disposal fees charges are determined by the Assembly. Some of the areas in the Assembly that enjoy this service are Manet, Maryville, Greda Estates, Regimanuel Gray Estates and Teshie-Nungua Estates.

On the other hand, the communal containers are used in the low income areas that have bad roads and majority of the people cannot afford the door to door service. Large waste containers are placed various vantage point points where people come and dump. These containers are placed in low income areas including markets and lorry stations. Unlike the door to door services where the fee for disposal is charged on a monthly basis, here fees are paid as you dump and according to the quantity of waste. There are about twenty-six sanitary sites provided with these containers and some of them are: Nungua Market, Teshie Market, Teshie Adoemli, Teshie Zongo and Nungua Coco Beach. The assembly has contracted some of the private waste companies like Zoomlion

Ghana to help empty these containers at least every two days. These waste companies are paid with Internally Generated Funds (IGF) and budgetary allocations from the government (known as the ‘Common Fund’). The Common Fund is a development fund that is intended to ensure equitable development of the various assemblies in the country. “It is a minimum of 7.5% of the national revenue set aside to be shared among all Districts, Municipal and Metropolitan Assemblies in Ghana (Common Fund, 2014)”. The Waste Management Department under the Health Department of the Assembly is responsible for the management of solid waste. Its role is to monitor the private waste companies to make sure they provide efficient services to their assigned areas and also adhere to sanitation laws. The department also monitors residents to ensure that they adhere to appropriate sanitary practices. Some solid wastes produced in the municipality are glasses, plastics, papers, leaves, food waste and home appliances. At the moment, there is no separation of waste and no recycling is done by the assembly. Recycling of plastic waste is very minimal and it’s done by private entities. Solid waste goes from collection and ends with disposal. All solid waste in the assembly is initially taken to the transfer station managed by Zoomlion within the municipality and later transported to the Kpone Landfill site.

4.2 Demographic Characteristics of Household Respondents

This section presents the results of the respondents concerning the background information. The background information includes their gender, household position, educational background, years of residing in the area and number of person in the house. The results were analysed and discussed using frequencies and percentages and presented in Table 1.

Table 1: Background Characteristics of Respondents

Variables	Sub-scale	Frequency	Percentages
Gender	Male	27	27.00
	Female	73	73.00
Household position	Head	32	32.00
	Spouse	35	35.00
	Other	33	33.00
Education background	None	11	11.00
	Primary	8	8.00
	Secondary	32	32.00
	Tertiary	19	19.00
	Other	30	30.00
Years of residence	Below 5years	23	23.00
	6-10 years	22	22.00
	11-14 years	10	10.00
	Above 15years	45	45.00
Number of persons	1-5 people	64	64.00
	6-10 people	30	30.00
	11-14 people	3	3.00
	Above 15 people	3	3.00

Source: Field data, 2017

Table 1 shows the results of the respondents pertaining to their background information. Regarding gender distribution, it was observed that majority of the respondents were females (n=73, 73.0%)

while the males were least represented (n=27, 27.0%). This suggests that the female respondents were more involved in waste management than their male counterparts. To the respondents' household position, it was evident that majority of the respondents were spouses (n=35, 35.0%). Those who were neither heads nor spouses followed (n=33, 33.0%). Those who were heads of households were the least (n=32, 32.0%).

In Table 1, It is clear that most of the respondents had secondary education (n=32, 32.0%). Those who had attained other education followed (n=29, 29.0%). Respondents who only acquired primary education were the least (n=8, 8.0%). This shows that majority of the respondents had some level of education and this could have implications on how they practiced solid waste management. Table 1 shows that 45.0% of respondents had lived in the municipality for 15 years, 10.0% had lived in the municipality between 11-14 years, 22.0% had lived within the municipality between 6-10 years and 23.0% below 5 years. Concerning the number of persons living in a household, 64.0 % indicated that they were between 1-5 persons, 30.0% between 6-10 persons, 3.0% had 10-14 persons and 3.0% above 15 persons per household.

4.3 Main Results and Discussion

This section presents the actual results of the study from both interviews and questionnaires. This was categorised based on the research questions. Four (4) research questions guided the study. The quantitative results from the questionnaires were analysed and discussed using frequencies as well as percentages and presented in tables.

4.3.1 The Goal of the Environmental Sanitation Policy

Policy according to Seow and Abas (2016) is a tool that has been used by many governments to achieve its goals of management and development. The effective management of solid waste has been identified to be one of the benchmarks for the measurement of a government's performance in other areas (Hoornweg and Bhada-Tata, 2012). In view of this, the Ministry of Local Government and Rural Development in 1999 formulated the first Environmental Sanitation Policy to guide the management of sanitation in Ghana.

During the formulation of the policy in 1999, global and national development concepts such as the Millennium Development Goals, New Partnership for African Development and the Growth and Poverty Reduction Strategy had not come into play. These regional and global agenda came along with certain notions of development and the delivery of services as a whole and therefore adjustments had to be made to meet these standards. This is in line with Bennett and Howlett's (1992) admonition that as conditions change, policy makers must also adapt to changing conditions to prevent policy failure. As a result of the shortfalls mentioned above, the Ministry of Local Government and Rural Development in collaboration with key actors in the waste management sector revised the obsolete Environmental Sanitation Policy in 2010 to meet changing context of national and international development priorities. Also, another important reason for its revision was to re-examine and deal with the issues that had led to the persisting underlying poor environmental sanitation and its vital link to health. The policy supports building partnerships both at international and local levels as well as with the private sector within an expanded network of actors through an effective public sector facilitation and coordination. (ESP, 2010). The overall goal of the policy is 'to develop a clear and nationally accepted vision of environmental sanitation as an essential social service and a major determinant for improving health and quality of life in

Ghana'. This implies that environmental sanitation is important to all persons and therefore no one should be denied access to proper services. Also, good health and good life are highly dependent on quality sanitation services.

To achieve the overall goal, the ESP 2010 outlines seven policy focus areas and challenges that need to be addressed and these include: Capacity development, Information, education and communication, Legislation and regulation, Levels of service, Sustainable financing and cost recovery, Research and development, Monitoring and evaluation. It is believed that improving on these focus areas would significantly improve sanitation services and make them more efficient and effective. "There are ten principal components of environmental sanitation in the ESP, 2010; Solid, Liquid and Gaseous waste management, Storm water drainage, Public cleansing, Control of pests and vectors of disease, Food hygiene, Environmental sanitation education, Inspection and enforcement of sanitary regulations, Disposal of the dead, Control of rearing and straying of animals and Monitoring the observance of environmental standards (Environmental Sanitation Policy, 2010)". However, the focus of this study was on the practice of solid waste management.

4.3.2 How the Environmental Sanitation Policy is being implemented in the Ledzokuku Krowor Municipal Assembly

The main objective of this research question was to determine the extent to which Environmental Sanitation Policy has been implemented in the Ledzokuku Krowor Municipal Assembly. This assessment was mainly based on six strategic focus areas identified in the policy. These are: Capacity development, Information, education and communication, Legislation and regulation, Levels of service, Sustainable financing and cost recovery, Monitoring and evaluation. The policy identified that the old policy had failed as a result of neglect of some of these areas. Therefore, the

new policy spells out these areas in order provide a clear strategic framework for achieving the overall goal (ESP, 2010). Under the policy, the Metropolitan, Municipal and District Assemblies are the main implementing agencies. The private sector, on the other hand, are to provide support to the MMDAs by providing the bulk of sanitation services through a franchise or contract agreement. Their work is to be supervised by the public service and must be in accordance with the policy. The users under the policy are the beneficiaries of sanitation services and also have a role to observe the appropriate sanitation practices in their environment. The findings gathered from these actors on the field are presented below.

4.3.2.1 Capacity Development

In most countries solid waste management is the responsibility of local authorities and in Ghana the practice is the same. The local authority in the case of this study is the Ledzokuku Krowor Municipal Assembly. Hoornweg and Bhada-Tata (2012) argue that municipal solid waste managers carry the enormous responsibility of getting waste out of the way and must do so in an economically, environmentally and socially optimal manner. Also, solid waste management is an intensive service and municipalities require capacities and expertise in areas such budgeting and finance, procurement and labour management to excel. These skills serve as prerequisite for the management other municipal services. The Environmental Sanitation Policy saw the need to improve human resources and to strengthen institutional capacities in order to improve sanitation services. Due to the changing nature and complication of solid waste generated in recent times, the local authorities need to be abreast with current trends. Under Capacity Development, the policy states that Metropolitan, Municipal and District Assemblies (MMDAs) should be provided

with specialized training in areas like environmental protection, contract management and supervision, public relations, monitoring and evaluation, etc. Also, the MMDAs should be adequately resourced with the appropriate logistics and working tools for the management of sanitation services.

In the interview with the Assistant Waste Management Officer of LEKMA, he acknowledged the need to have the right people in place to manage waste and also the importance of trainings to improve on skills and learn new things. He pointed out that;

‘The Assembly employs sanitary laborers to beef up the strength of Zoomlion. Aside the sanitary laborers, the rest of our staff employed are from the School of Hygiene and other universities with knowledge in waste management. Also, we normally should undertake quarterly trainings. The HRM designs or brings out the plan’. However, due to unavailability of funds the training comes in once in a while. So far, we’ve had trainings in human relations which has improved our approach to our clients in service delivery and education (Assistant Waste Management Officer, LEKMA).

Also all the private waste companies interviewed reiterated the importance of human resource development and also agreed that they have various training programs in place for the different category of staff they employ. Though they acknowledged the importance of trainings, they were reluctant to give the details because they considered it as ‘trade secrets’.

Another important component of capacity development is the availability of logistics and the necessary equipment to deal with the challenge of solid waste. All the four private waste companies interviewed agreed that they had enough logistics and equipment to deal with solid waste management and it was based on this criterion that they were selected to work with the Assembly. The General Manager of Asadu Royal in response to the question of logistics and equipment said;

'...once you take the contract you should be ready to invest in order to deliver efficiently' (General Manager, Asadu Royal).

However, on the other hand, the Assembly complained of inadequate logistics and equipment which made it difficult for them to play their part efficiently and effectively. According to the Assistant Waste Management Officer of LEKMA, the Assembly at the beginning of the implementation of the policy, had 1 compactor, 2 roll-on and roll-off and 1 multi lift to use in case the private contractors had challenges. This he said was inadequate and as at now only one compactor is functional for both the Teshie and Nungua towns. He further lamented that:

'Our main bane is inadequate logistics. It isn't just trucks. It cuts across rakes, hooks, personal protective equipment and cleaning materials too' (Assistant Waste Management Officer, LEKMA).

4.3.2.2 Education, Information and Communication

According to the ESP (2010), attitudinal and behavioural change is central to achieving sustainable progress in environmental sanitation. Environmental education in itself is not enough to ensure improvement in environmental sanitation. Neither is the provision of infrastructure unless they are utilized properly. However, the policy acknowledges that environmental sanitation education, effective communication and dissemination of information are considered as integral elements of all environmental sanitation services.

Under the policy, the assembly is responsible for providing awareness on the importance of environmental sanitation, ensure every resident participates in the Environmental Sanitation Day

(ENSADA) and also educate individuals and households on their roles in the improvement of environmental sanitation.

This study revealed that the assembly makes use of the house to house approach, town hall meetings, the local media as well as the Assembly van to educate the residents on the importance of adhering to proper sanitary practices. The house to house approach is done on a daily basis where Environmental Sanitation Officers move from house to house within the municipality to educate households on how to keep their surroundings clean and manage their waste properly. The town hall meetings are organized twice in a year. That is one in the first quarter and the other in the last quarter.

The Assistant Waste Management Officer further stated that:

'We have eight hygiene education programmes in a year. Two in every quarter and these are split between Teshie and Nungua. We normally have these programmes in churches so we can have access to more people. We at times have education in the markets and then we also use the radio stations specifically the 'Wommre Nie' radio at the Nungua market and 'LATENU' to do the education' (Assistant Waste Management Officer, LEKMA).

When asked further about the impact education and information had had on the municipality he had this to say:

'Education in my perspective has gone a long way. Since the outbreak of the cholera epidemic last three years (2014) in the municipality, we've intensified education and as at now record low levels of cholera patients. We've been getting information from the Municipal Health Directorate and it's gone very down. Last year and this year we have recorded no deaths' (Assistant Waste Management Officer, LEKMA).

Table 2: Respondents' Awareness of Environmental Sanitation

Variables	Sub-scale	Frequenc y	Percent
Knowledge	Yes	48	48.0
	No	44	44.0
Sources of Information	Public education	9	9.00
	Media	38	38.00
	Other	1	1.00

Source: Field Data, 2017

To confirm the work being done by the Assembly, the household respondents were asked about their knowledge on environmental sanitation. Displayed in Table 2 above, it was found that out of 100 respondents, only 48(48%) of them were aware of the policy while 44 of them representing 44% claimed that they lacked knowledge on environmental sanitation. 8 people representing 8% didn't respond to this question at all. This therefore explains the total number of respondents to this question being 92. 9% out of the 48% confirmed that they received their education from the Assembly's Public education programme, 38% from the media and the rest of the 1% from other sources like friends and family members. This implies that though almost half of the sampled population knew about environmental sanitation, more needed to be done to educate the rest of the people on the right sanitary practices.

4.3.2.3 Levels of Service

The Environmental Sanitation needs of groups in society differ. Therefore, to ensure clean and safe environment, sanitation services must be tailored to fit the varying needs of the targeted

population. The underlying principle of the Environmental Sanitation Policy is to ensure that the choice of service levels for any segment of the population is reflective of their needs and demands. Also, the choice of technologies must adhere to regulations in order to safeguard public interest and the right of all (ESP, 2010).

Solid waste management in the Ledzokuku Krowor Municipal Assembly is carried out in two folds to meet the different needs of the population. These folds are the Communal Container System also known as the Central Container System and the door to door service delivery. For the Central Container System, centralized containers are placed at vantage sanitary sites. This targets low income areas and places with unplanned routes where waste collection vehicles cannot have access to service the people. These containers are managed by the Assembly but some private waste companies have been given the mandate to lift when full for a fee. According to the Waste Management officer, the assembly has 22 containers placed at various sites to serve the people of Teshie and Nungua. The house to house service is undertaken by private waste companies. This service is offered mainly to the residents in the medium to high income areas. It is also for areas with planned routes where collection vehicles can easily access. Under this service, waste is collected at the doorstep of clients for a fee which is directly paid to the private waste company on a monthly basis. Furthermore, the levels of service section of the Environmental Sanitation Policy instructs that, the bulk of environmental sanitation services be given to the private sector under the supervision and regulation of the public sector. Before the Policy in 2010, majority of solid waste services in LEKMA were carried out by the Assembly with the presence of only one private waste company (Daben Cleansing Services). Currently, the Assembly has contracted out solid waste services to six contractors and only supports in cases of challenges with the private companies. The Assistant Waste Manager explained that:

'We now have six contractors operating in the municipality and the Assembly has given each a zone to operate' (Assistant Waste Management Officer, LEKMA).

4.3.2.4 Sustainable Financing and Cost Recovery

Sanitation is an essential social service and therefore should be provided for all. To ensure the success of services, reliability and regularity are essential. The ESP (2010) reiterates this fact by stating that 'affordable services which are consistently provided will almost always yield better results than more expensive services provided irregularly'. It is therefore important that service levels provided are economically appropriate and financially sustainable.

The Environmental Sanitation Policy upholds the principle of the 'polluter-pays' and therefore encourages its use by MMDAs in the determination of fee to be charged residents for solid waste services. The study found that, the Assembly's main sources of revenue and funding to support solid waste services was from Internally Generated Funds (IGF), the Assemblies' Common fund and charges from the Communal Container Services. The Assembly, though it helps to fix fees for the private waste companies to charge beneficiaries of the house to house services, does not benefit directly from the service. However, the private waste companies are charges Business Operating Permits on an annual basis and this support the Assembly in the provision of other sanitation services. The representative of the Assembly explained that:

'Sanitation services are financed through the Common Fund, Internally Generated Funds and sometimes donations from volunteers. These funds are used to purchase sanitary tools, organize clean ups and lift containers' (Assistant Waste Management Officer, LEKMA).

He also added that:

'Though we are supposed to recover cost from the communal container, we rather spend because the charges are subsidized and most of the people are unwilling to pay for dumping. However, the little we make is used to pay for the charges at the landfill site' (Assistant Waste Management Officer, LEKMA).

4.3.2.5 Legislation and Regulation

The way sanitation is carried out is a reflection of the way of life of a people. To ensure compliance and orderliness, there must be rules and regulations governing various activities. The ESP (2010) agrees that effective enforcement management is a critical element of engendering behavioural change. The policy therefore supports the enactment of necessary legal instruments to support institutional functions.

The study found that LEKMA has a set of by-laws that govern the activities of the Assembly. The bye-laws are updated from time to time to meet changing trends and challenges. The bye-laws spells out sanitary practices that should be upheld by all residents and also rules and regulation that govern the activities of both the assembly and private waste companies. Also the assembly has a sanitation court at its head office where sanitation offenses are prosecuted.

In explaining the procedure for enforcing sanitary laws, the Assistant Waste Management Officer stated that:

'...any offense that we chance upon, we first give the households education and give them a number of days to clear the nuisance. When we do a follow-up and the offender fails to clear the nuisance, a court summons is served indicating the time and date the person has to appear before the magistrate. The matter then leaves our hands into the hands of the magistrate' (Assistant Waste Management Officer, LEKMA).

On the part of the private waste companies, failure to provide satisfactory services warrants termination of contract with the Assembly. It starts with complains from clients, then a warning is issued to the contractor. If the contractor fails to comply after the ‘grace period’, the contract is revoked and the zone given to another contractor. However, according to the Assistant Waste Management Officer:

‘Since we started working with the contractors, we haven’t had any cause to revoke any contractor’s contract’ (Assistant Waste Manager Officer, LEKMA).

4.3.2.6 Monitoring and Evaluation

Monitoring and Evaluation helps track how implementation is progressing and also helps provide improvement in responding to emerging issues. The Environmental Sanitation Policy acknowledges the importance of this action and therefore requires that the various institutions should have mechanisms in place for monitoring and evaluation.

The MMDAs are responsible for monitoring the activities of both users and the private sector to ensure that they all comply with the appropriate sanitary laws and practices. Also, they expected to evaluate the impact of activities like education and services provided. This would help improve on shortfalls and also provide satisfactory services. When asked on the mechanisms put in place by the Assembly to monitor and evaluate progress of solid waste management, he commented that:

‘The assembly monitors activities through our Environmental Health Officers, the media and the community. The Environmental Health Officers visit the houses and the communal sanitary sites daily and give us reports on which we act on. Also, we have quarterly meetings with the private contractors where we evaluate the services provided, share challenges encountered and we act on them. Furthermore, we take seriously complaints from the community and ensure that private contractors do their work accordingly’ (Assistant Waste Management Officer, LEKMA)

This was confirmed by one private contractor who said:

'The Assembly has officers on the ground who provide daily and monthly reports on work done. Our officers also provide monthly data to the office, Assembly and any relevant stakeholder'
(Operations Manager of a private waste company).

4.3.3 Successes resulting from the Implementation of the Environmental Sanitation Policy in Ledzokuku Krowor Municipal Assembly

The study found that the major success that LEKMA has chalked during the implementation of the Environmental Sanitation Policy has been the involvement of private waste contractors. Before the policy, the Assembly provided majority of waste management services and only had one private waste contractor supporting. This contractor was the Daben Cleansing Services. As a result of the Environmental Sanitation Policy and its support for Public Private Partnership (PPP), the Assembly has been able to contract five other private waste management services who now provide majority of solid waste services to the municipality. As a result of the PPP arrangement, waste services are provided to the door steps of many households in the municipality and the assembly has got support for the inadequacy of their equipment. The Assistant Waste Management Officer commented that:

'The private sector has lent a lot of support in terms of waste management because the door to door is very effective and there are less complaints from household. Also, Zoomlion provides majority of the centralized containers and the other private companies support with logistics to organize massive clean-ups. The private contractors have been of massive help to the Assembly'
(Assistant Waste Management Officer, LEKMA).

Also the involvement of the private sector has created employment for a lot of the youth in the Assembly. For example, aside solid waste clearing and collection, Zoomlion operates a transfer station in the municipality. This employs many people. According to the Assembly, about 400 people have been employed by Zoomlion under the Youth Employment Program.

Another success is the reduction of refuse heaps in the Assembly. Through massive education and the support of the private sector, heaps of rubbish which were commonly found around the municipality have reduced. Though record keeping on waste generation and collection is poor in the assembly, the Assistant Waste Management Officer stated that about 70% of waste is now collected by the private contractor. This is an improvement from the initial 30% when it was solely done by the Assembly. The General Manager of one private company supported this by saying that:

'...formally, you could see heaps all around the place. When we started, we started by evacuating heaps. Allowing the contractors has helped a lot and educating the people too' (General Manager of a private waste company).

4.3.4 Challenges

The main objective of this section was to determine the challenges encountered by the assembly, private waste contractors and the household during the implementation of the policy.

4.3.4.1 Challenges of the Assembly

First of the assembly is faced with serious capacity challenges. They are challenged in terms of finances, logistics, staff strength and equipment and this makes it difficult for them to carry out solid waste management services. The Assistant Waste Management Officer lamented that the

budgetary allocation given to the assembly for solid waste is highly inadequate and this poses a lot of challenges. Also, the money received from the centralized containers is very minimal due to refusal of residents to pay for the service. He further noted that:

'Inadequate logistics and our staff strength is nothing to write home about. The assembly has only 42 sanitary labourers which is inadequate. We have been given a cut off so we can't recruit until one laborer goes on retirement' (Assistant Waste Management Officer, LEKMA).

The Assembly is then forced to rely on the private contractors who also withdraw their services in cases of delays in payment of their monies. This is a contributing factor to why the assembly is unable to keep the sanitary sites clean and this has serious health implications.

Another challenge faced by the Assembly in monitoring both the private contractors and residents is political interferences. Aside the problem of limited staff, politicians interfere with the effective enforcement of sanitation laws. According to the assembly due to the political linkages of some of the private waste contractors, they refuse to abide by the regulations of the Assembly. Also in some cases when offenders are arrested they contact some politicians and the assembly is unable to continue with prosecution. For example:

'When summons are given to people to appear before court, politicians would just come and order the chief to strike out the case. So the case would just end abruptly and it's not carried to its full completion' (Assistant Waste Management Officer, LEKMA).

Lastly, the Assembly experiences apathy on the part of some residents. Despite the massive education carried out by the assembly on the right sanitary practices, some residents have decided not to adhere to rules and regulations. Some continue to dump at the beaches, in gutters and anywhere around the community. The Assembly's representative bitterly stated that:

'The Assembly cannot be everywhere all the time. We also cannot arrest everyone at the same time. Therefore, some people have decided not to heed to our education and do what they like. This makes our work so difficult' (Assistant Waste Management Officer, LEKMA).

4.3.4.2 Challenges of private waste contractors

From the study, it has been established that the private waste contractors have played a significant role in the management of solid waste in LEKMA. However, since the implementation of the policy began and the private sector got involved with solid waste management in the municipality, a number of challenges have come up.

To begin with, almost all the contractors complain of zoning challenges. In 2016, the assembly divided the municipality into zones. This was to solve the problem of contractors interfering with each other's work. Therefore, every contractor was given a zone. However, some contractors have refused to stick with their zone and keep crossing into other zones. The contractors accuse the assembly of looking on and doing nothing. This is affecting the revenue they make and impeding the efficiency of their work.

On the other hand, the contractors who do not want to stick to the zoning arrangement complain that they have provided bins for their former clients and therefore leaving them to new zones means a loss of investment. Another zoning interference has to do with a new group of waste collectors known as the 'kaya borla'. 'Kaya Borla' is a term given by residents to a group of freelance tricycle riders who collect waste from house to house for a fee. This group are not recognized by the assembly but have found a way of collecting waste from residents. These freelance waste collectors, though unauthorized, manage to collect waste from the same clients assigned to the authorized private contractors. This leads to revenue losses for the private contractors.

Another challenge brought to the fore by the private waste companies is the unwillingness of clients to pay for services. This affects their input into solid waste management. They complain that some of the clients especially those in the low income areas do not attach importance to waste and therefore do not see why they should pay for the service. One contractor said:

'Previously the assembly was collecting waste for free so they are used to that. Now that they are charged for it, they find it difficult to accept change. This same people are those who generate more waste but do not want to pay' (General Manager of a private company).

Another also commented that:

'People shop in millions but when what they shop for becomes waste and they are asked to pay a few cedis, it becomes difficult' (Operations Manager of a private waste company).

Aside the unwillingness of the residents to pay, the contractors also complain of government delays in paying for services the government has contracted them to do.

Lastly, the assembly is supposed to fix fees charged by the private waste companies every year. The assembly complains of reports received from households that private companies are charging too high. However, the private companies complain that the assembly fails to consider economic changes in their fee fixing and this affects their cost of operation. Therefore, some of them are forced to charge high fees to support their work. One contractor stated that:

'Satisfaction comes with price increments, though we are not supposed to change the price fixing, sometimes based on certain factors, we make price adjustments' (General Manager of a private waste company)

4.3.4.3 Challenges of households

As beneficiaries of sanitation services, the households also expressed their challenges through the questionnaires administered. The tables below display their responses.

Table 3: Challenges Facing User of Private Wastes Collectors

Variables	Frequency	Percent
High charges with or without notice	13	13
Poor customer relations	8	8

Source: Field data, 2017

Table 3 shows the respondents' perceived challenges faced using private waste collectors. The households complained of high charges as well as poor human relations from some of the workers of the companies. The majority (n=13; 13%) of the households indicated that the private wastes collectors charged high fees for the services rendered. Similarly, 8(8%) of the household revealed that the private wastes collectors had poor human relationships with their customers/clients. Perceived high charges and poor human relations may lead residents to resort to disposing of their wastes by other mean like burying, burning, dumping into gutters and other unwanted places. This might create environmental problems which further impede the success of the policy implementation.

Table 4: Challenges facing users of the Communal Waste Containers

Variables	YES	NO
	N (%)	N (%)
Delays	14(14%)	2(2%)
Air pollution	14(14%)	3(3%)
Bad Stench and mosquito	15(15%)	2(2%)
High charges	2(2%)	5(5%)
Bad customer relations	3(3%)	13(13%)

Source: Field Data, 2017

Table 4 shows a number of challenges faced by households that patronize the communal containers. Some of the challenges are delays in lifting, bad stench and bad customer relations among others. The (n=14; 14%) of the households complained that the community containers had bad stench or unpleasant smell and also served as a breeding ground for mosquitoes. Similarly, (n=14; 14%) of households complained of air pollution as a result of burning from the sites. 15% complained of bad stench and mosquitoes breeding on the grounds. All of these challenges pose serious health issues to the communities and the municipality at large.

4.3.5 Improving Policy-Practice Issues of Solid Waste Management

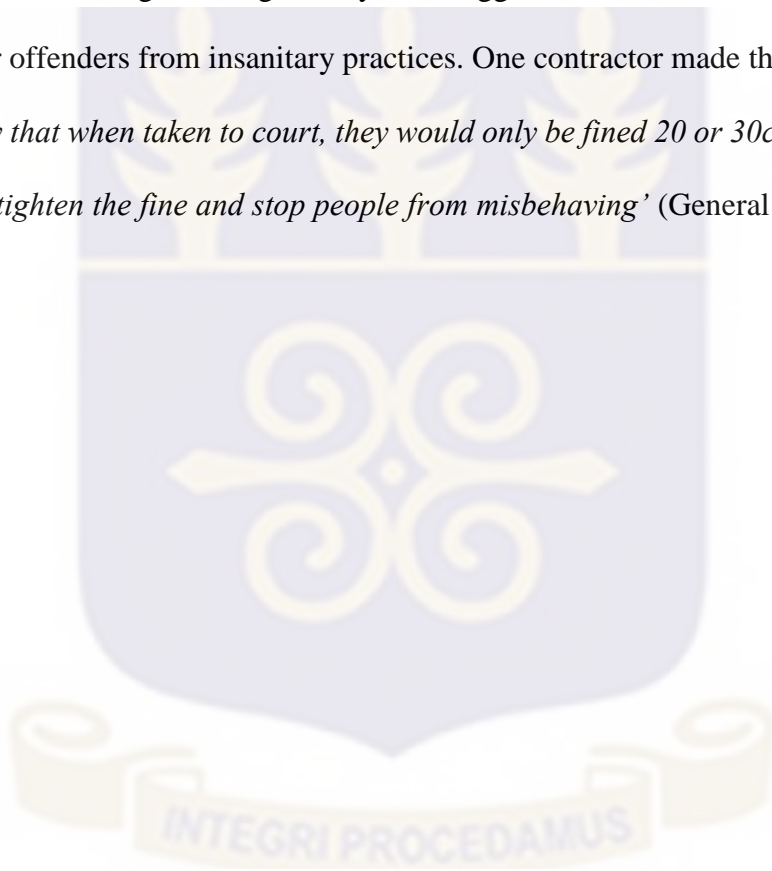
The study went further to ask the various participants what can be done to improve on the implementation of the policy in relation to solid waste management.

The Assembly acknowledged that their major problem is finances. The policy is good on paper but without the right amount of financial support they cannot undertake the programmes spelt out

in the policy. Sanitation is an important service to society. Therefore, the assembly recommends that government should prioritize sanitation and invest more into it in order to have a clean society. Also they recommend that politicians in assembly should desist from interfering with their work so that they can effectively enforce sanitation laws.

The private waste companies also recommend that the assembly should strengthen its monitoring and enforcement services so that there can be order in the performance of their duties. They said this in relation to the zoning challenge. They also suggest that the fine for offenses should be increased to deter offenders from insanitary practices. One contractor made this comment:

'The people know that when taken to court, they would only be fined 20 or 30cedis. Therefore, the assembly should tighten the fine and stop people from misbehaving' (General Manager of private waste company)



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION RECOMMENDATIONS

5.0 Introduction

Solid waste management is one of the most important public services that if not properly carried out can cause serious health and environmental implications. Solid waste management has created a lot of challenges for many municipalities in Ghana and the Ledzokuku Krowor Municipal Assembly (LEKMA) is one of them. In view of the solid waste menace across the country, government thought it wise to formulate the Environmental Sanitation Policy to serve as a guideline for the management and provision of services. This study therefore sought to assess the congruence of the Environmental Sanitation Policy with the practice of solid waste management in LEKMA. To successfully undertake this study, both qualitative and quantitative methods were used. This allowed key informants in solid waste management and policy implementation to express their views freely through interviews and also the household who are the main beneficiaries of solid waste services were also represented through the administration of questionnaires. Also, observation was also used to verify the information given by the participants. The chapter gives a brief summary of major findings, recommendation on how to improve on the implementation of the sanitation policy in relation to solid waste practices as well as conclusions.

5.1. Summary of Findings

Findings from this study indicate that there has been significant improvement in the management of solid waste. However, there is still more to be done. The findings expose that gaps still exist between policy and practice. The strength of the Environmental Sanitation Policy (2010) is that it clearly spells out the various actors and their roles in environmental sanitation. Thus, eliminating

the challenge of overlapping responsibilities of actors and task duplication. It also identifies the problem areas that need to be dealt with in order to achieve a clean and healthy society. Nonetheless challenges still exist in managing waste. The findings identify the Assembly, Private contractors and Households as the main actors of solid waste management in the municipality.

The Assembly plays a major role in solid waste management. They are mandated by the Environmental Sanitation Policy to implement strategies for the effective management of waste. As part of their strategies they engage private waste companies to provide solid waste services to residents and households in the municipality. They are responsible for educating residents on sanitary laws and practices. Also, they are to monitor and make sure that residents comply with sanitary laws and punish defaulting waste contractors as well as residents involved in illegal dumping of waste.

The private waste contractors are contracted by the Assembly to provide bulk of solid waste services to the municipality as stipulated by the policy. The study found that LEKMA has six contractors. These are Zoomlion Ghana, Rural Waste Company, Asadu Royal, J. Stanley Owusu Company, Daben Cleansing Services and Ashbod Company. They are assigned to various locations within LEKMA to provide house to house services and in some cases communal containers at designated sites. They also support the Assembly with other sanitation activities like clean-ups from time to time. From the findings, the involvement of the private contractors has brought significant improvement in the management of solid waste in the municipality. They supplement the Assembly's staff and equipment inadequacies.

The households are the main beneficiaries of solid waste services provided by the Assembly and private contractors. They generate majority of waste in the municipality and determine the type of services to use based on the options available to them. Some households are involved in illegal

dumping, burning and burying of their waste. Others reuse some waste products or sell them to scavengers for a fee. Other actors that were ignored in the policy and not recognized by the Assembly are scavengers and 'Kaya Borla'.

Scavengers are those who extract recyclable materials from households and communal container sites within the municipality. Their activities help reduce waste generated and they also make a living through that. The 'Kaya Borla' on the other hand are freelance tricycle riders who collect waste from households. Due to their sizes, they are able to easily access areas with unplanned routes where the big waste vehicles cannot go. From observation on the field, these actors play an important role in helping minimize waste and reaching areas where the vehicles of the authorized private contractors cannot access. Their exemption from the policy is a major pitfall identified.

The study found that though there has been improvement as a result of the involvement private waste companies and the increase in education there still exists a myriad of challenges that are impeding the successful implementation of the Environmental Sanitation Policy.

The Assembly is faced with financial challenges making it difficult for them to meet their obligations successfully. For example, they are sometimes unable to pay private waste contractors to lift containers at the communal sites. This leads to waste overflowing and leaving an awful stench which is dangerous to the health of households living close to the sites. Also, they have limited number of staff and therefore have difficulty in effectively monitoring the activities of contractors and resident who default. Also, as a result of political interferences they are unable to enforce compliance to sanitary laws.

The private contractors also complain of the unwillingness of residents to pay for services thus impeding with the regularity of their service provision. Also, delays on the part of government for

services rendered makes it difficult for their staff to be paid on time, leading to withdrawal of services. Furthermore, the zoning challenges coupled with the activities of 'Kaya Borla' also affects their operations.

The households also complain of the distance to communal containers and the insanitary ways in which the sites are managed. They are also not involved in decision making in the Assembly and services and charges are just imposed upon them. This has resulted in a number of them adopting their own means of waste disposal which is contrary to sanitary laws.

On the whole, the study found that the Assembly is committed to implementing the policy. Their aim is to ensure that the municipality is clean and safe for its residents. However, without the needed resources and support the Assembly and all other stakeholders cannot fulfil their obligations under the policy.

5.2 Recommendations and Conclusion

Based on the findings of the study, the following recommendation are made to improve on the implementation of the Environmental Sanitation Policy with respect to solid waste management in the Assembly and Ghana as a whole.

Solid waste management is important in every community and as Hoornweg and Bhada-Tata (2012) posit, the effective management of solid waste is an indicator that other services can properly managed in the municipality. Therefore, I recommend that government should give more attention to solid waste management. Most governments tend to give more attention to other areas that generate more income than sanitation services. However, if more attention and resources are given to waste management it can in turn yield more revenue through activities like recycling.

Also, the Assembly which is the main implementing agency should be well resourced to perform its duties effectively. Moreover, the Assembly should strengthen its monitoring and enforcement to ensure that both users and private waste companies adhere to sanitation practices. Aside education, the assembly could come up with incentives like sanitation awards for the various communities every month. This would encourage the residents to take up sanitation more seriously and in the end create a safe and clean municipality.

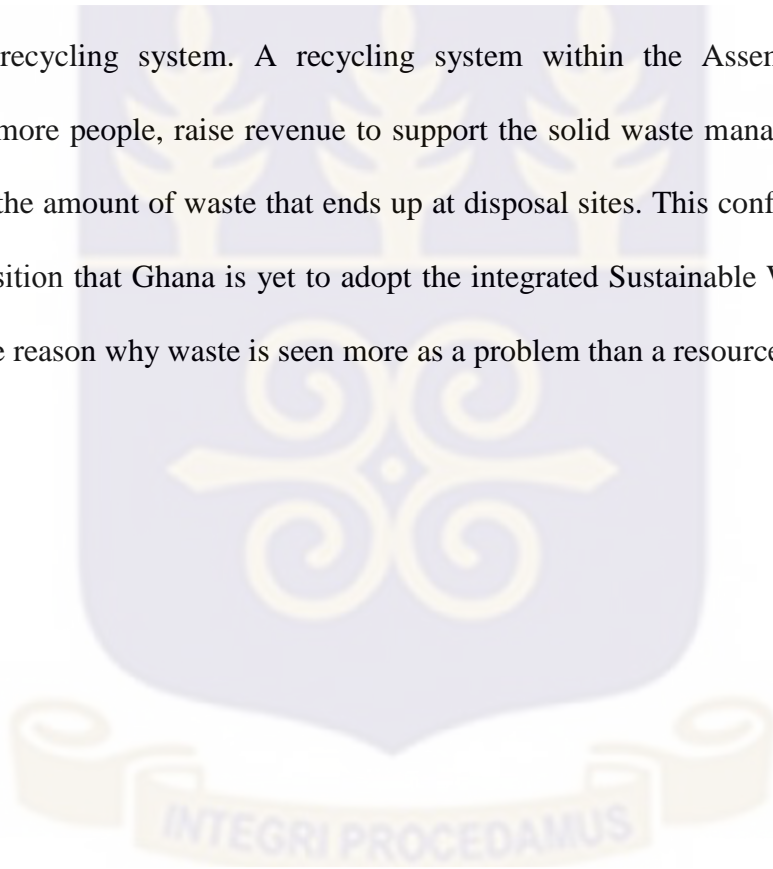
From observation, I noticed that the 'Kaya Borla' was helping greatly in waste collection. These tricycles are able to easily manoeuvre in the inaccessible areas that the private contractors have difficulty serving. However, since they not legalized, private contractors see them as a threat. I therefore recommend that the assembly creates a platform for these drivers and formalize their activities in order for them to support with the provision of solid waste services.

The study concludes that the policy is good on paper and the assembly is doing its best to match up the principles of the policy. However, without the corresponding transfer of adequate resources, the Assembly is handicapped as to the extent to which it can go. This confirms Oteng-Ababio's (2010) assertion that regardless of their sophistication environmental policies are unlikely to be successful without the corresponding integrated management infrastructure, which in turn requires political leadership and commitment.

Furthermore, based on the theoretical framework used the study identified that solid waste management in the municipality is not integrated. The proponents of the Integrated Sustainable Waste Management believe that in order to succeed in solid waste management, the actors, elements and sustainability aspects must be in harmony (van Klundert and Anschutz, 2001). LEKMA has not been able integrate all actors in solid waste management. For example, informal private waste collectors like the 'Kaya Borla' and scavengers have not been given recognition

despite their immense contribution to waste management. Also in the making of decisions concerning waste management, households are not consulted. This makes them reluctant to adhere to laws. Instead of viewing the households as the causes of the problem, the Assembly should see them as part of the solution and get them involved in decision making.

Also, considering the flow of elements in the waste management system of the Assembly, waste moves from collection to transportation and then to disposal. At the moment, no value is added to the waste. Only a few houses reuse waste materials and sell some to scavengers but the Assembly has no official recycling system. A recycling system within the Assembly would create employment for more people, raise revenue to support the solid waste management system and also help reduce the amount of waste that ends up at disposal sites. This confirms Oteng-Ababio et al (2011)'s position that Ghana is yet to adopt the integrated Sustainable Waste Management model. This is the reason why waste is seen more as a problem than a resource.



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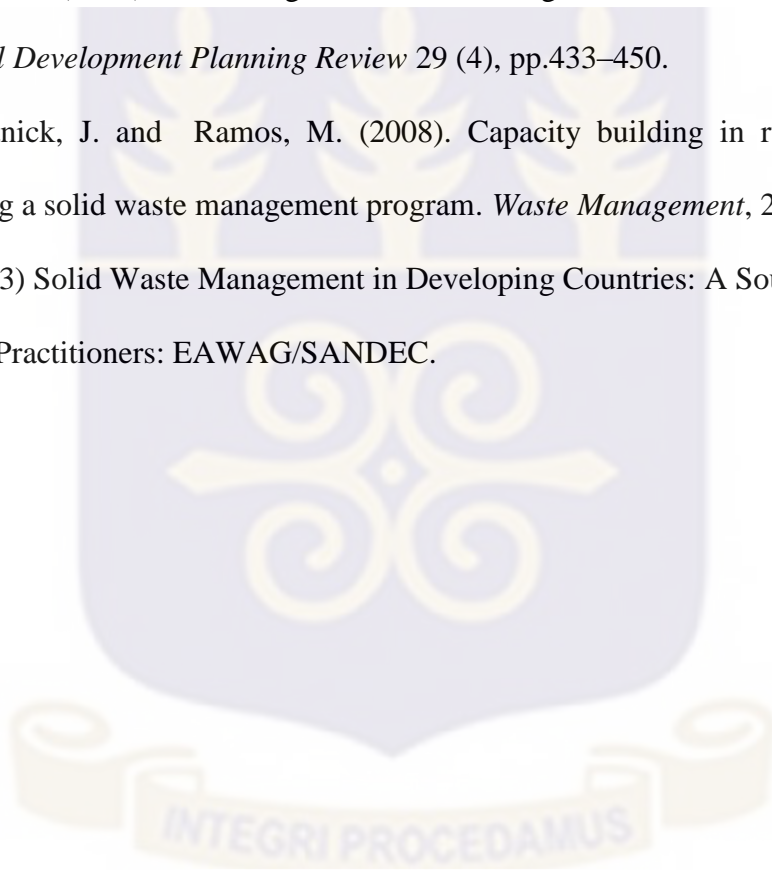
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APPENDICES

Appendix 1: Interview Guides

DEPARTMENT OF POLITICAL SCIENCE

UNIVERSITY OF GHANA, LEGON

**THE ASSESSMENT OF THE CONGRUENCE OF THE ENVIRONMENTAL
SANITATION POLICY WITH PRACTICE IN THE LEDZOKUKU KROWOR
MUNICIPAL ASSEMBLY**

This research is being conducted by Jemimah Ewusi, a student from the Department of Political Science, University of Ghana, Legon towards an award of a Master of Philosophy in Political Science. The main aim of this study is to assess the congruence between the Environmental Sanitation Policy (2010) and practice in the Ledzokuku Krowor Municipal Assembly. The research is purely for academic purpose and as such, your response will be treated as confidential.

I would be grateful if you could help by volunteering information for this study.

Thank you.

A. INTERVIEW GUIDE (WASTE MANAGEMENT DEPARTMENT)

Name of interviewee

Position

Date and Time of interview

1. Do you know about the existence of the new Environmental Sanitation Policy (2010)?
2. Does the policy sufficiently address your concerns?

Capacity and Development

3. What is your role under the policy?
4. What stages does solid waste go through in the Assembly?
5. What kind of staff does the assembly employ to manage solid waste?
6. Are sanitation management training programs available for staff?
7. What kind of training and how often?
8. What equipment are at your disposal and are they suitable for the local conditions?
9. How do you deal with equipment availability and maintenance?
10. How many private waste companies are involved in solid waste management in the municipality?
11. What were the criteria for their selection?
12. What has been the contribution of the private sector since their inclusion in solid waste management?

Education, Information and Communication

13. Does the assembly embark on public education on solid waste management?
14. How is data on waste management generated and kept within the municipality?
15. Are you able to keep record on the amount of solid waste generated?

Level of Service

16. What measures has the municipality put in place to ensure that delivery of service is tailored to the various needs of customers?

Sustainable Finance and Recovery

19. How do you generate revenue?

Monitoring and Evaluation

20. Does the municipality have a plan for solid waste management?

21. Do you have mechanisms in place to monitor and evaluate progress made by the municipality so far?

22. What are the major challenges confronting the municipality?

Legislation and Regulation

23. How do you deal with non-compliance with rules and regulation governing solid waste generation and disposal?

24. Are there other comments you would like to make?

A. PRIVATE WASTE MANAGEMENT COMPANIES

Name of Interviewee

Position

Date and Time

1. Are you aware of the new Environmental Sanitation Policy?
2. Were you involved in the formulation process?
3. Does it address your concerns as an agent?

4. How long have you been working with the municipal assembly and what were the criteria for your selection?
5. What specifically is your role as a private waste company?
6. What category of staff do you employ?
7. Do you have a training program in place to equip them to manage solid waste satisfactorily?
8. Who are your customers and how would you describe their attitude towards solid waste disposal?
9. What is the flow of waste in the municipality and how do you manage it?
10. Are you able to keep records on the amount and types of wastes generated by your customers?
11. How many tonnes of waste do you collect in a day?
12. What type of equipment do you use and are they suited for the locality?
13. Do you have enough equipment and human resource to deal with the waste generated?
14. What are your sources of funding and how do you generate revenue?
15. How do you determine charges for waste collection from your various customers?
16. What are your challenges as a private waste company?
17. Are there any other comments you would like to make?

APPENDIX 2: Household Questionnaire

This investigation is being conducted by a student, from the Political Science Department of the University of Ghana, Legon towards an award of a Master of Philosophy in Political Science. The aim is to assess the congruence of the Environmental Sanitation Policy and practice in the Ledzokuku Krowor Municipal Assembly. You are humbly requested to objectively respond to questions below. Please note that the study is for academic purpose thus anonymity would be strictly maintained.

You are please reminded to ONLY tick [] the appropriate option(s).

Section A: Demographic characteristics of the respondents

1. Gender: Male [] Female []
2. Position in the household
Head [] Spouse [] Other []
3. Educational Background
None [] Primary [] Secondary [] Tertiary [] other []
4. How long have you been living in the municipality?
Below 5 years [] 6-10years [] 11-14years [] above 15years []
5. Number of persons in the household
1-5 [] 6-10 [] 11-14 [] above 15 []

Section B: Awareness of Environmental Sanitation

6. Do you know about environmental sanitation?

Yes [] No []

7. If yes, how did you get to know?

Assembly's Public Education [] Media [] Friend/ Relative [] other []

Section C: Attitude towards Solid Waste Disposal

8. What type of solid waste do you generate often?

No.	Type of waste generated	Yes	No
1	Plastic		
2	Metals		
3	Paper		
4	Food leftover		
5	Wood		
6	Bottles		
7	Diapers		
8	Others		

9. How do you dispose solid waste generated? Please tick one or more as applicable

No.	Disposal method	Yes	No
1	Burning waste		
2	Burying in the ground		
3	Dumping in gutters		
4	Storing in containers for collection		
5	Dumping at the public dump		
6	Sweeping into gutters/drains		
7	Giving to livestock		
8	Dumping around the neighbourhood		
9	Others (please specify)		

Section D: Households using door – to- door services

10. Is there a private or public waste collection service in this area?

Yes [] No []

11. Do you use the service?

Yes [] No []

12. On a scale of 1-5 with 5 being excellent and 1 being very poor, how would you rate service provided by the company?

5	4	3	2	1
Excellent	Good	Fair	Unsatisfactory	Very Poor

13. What are the challenges you have with this company?

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

14. In what ways do you think the company can improve its services?

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

Section E: Households using communal containers

15. Is there a community waste container in this area?

Yes [] No []

16. Do you use the service?

Yes [] No []

17. Indicate your reason for the choice above?

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

18. On a scale of 1-5 with 5 being excellent and 1 being very poor, how would you rate service provided under the community container waste disposal arrangement?

5	4	3	2	1
Excellent	Good	Fair	Unsatisfactory	Very Poor

19. What challenges do you face with the communal waste container service?

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20. What do you suggest can be done to improve the service?

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