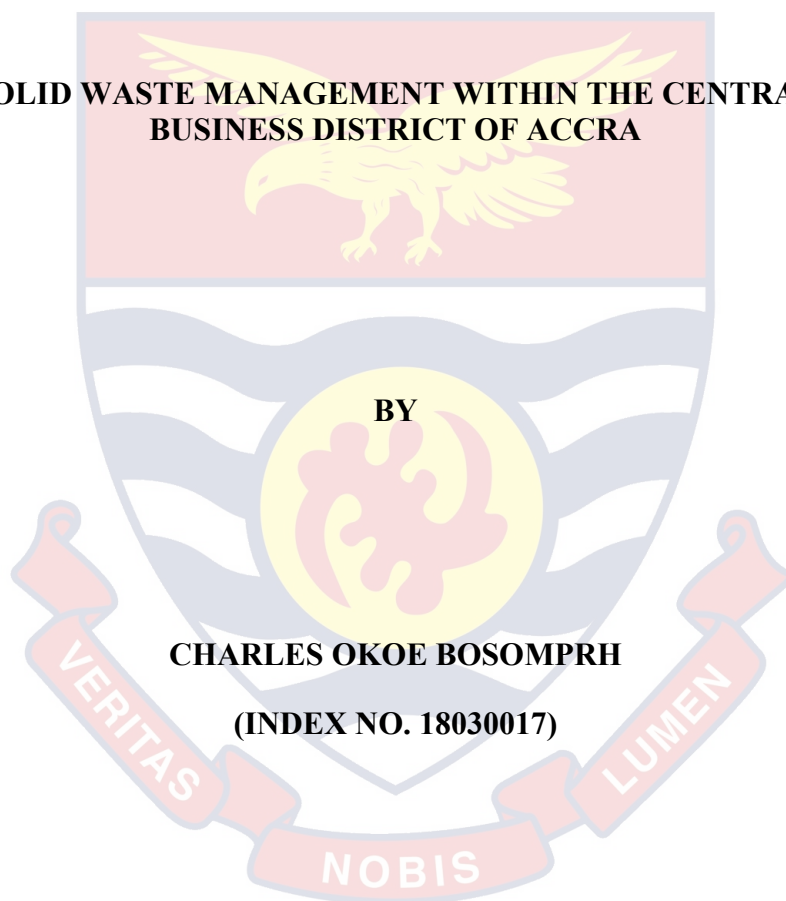


**PRESBYTERIAN UNIVERSITY COLLEGE OF GHANA**

**FACULTY OF DEVELOPMENT STUDIES**

**SOLID WASTE MANAGEMENT WITHIN THE CENTRAL  
BUSINESS DISTRICT OF ACCRA**



**BY**

**CHARLES OKOE BOSOMPRH**

**(INDEX NO. 18030017)**

**THIS DISSERTATION IS SUBMITTED TO THE PRESBYTERIAN UNIVERSITY  
COLLEGE OF GHANA IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR  
THE AWARD OF MASTER OF SCIENECE DEGREE IN ENVIRONMENTAL  
HEALTH AND SANITATION.**

**AUGUST, 2019**

## DECLARATION

### CANDIDATE'S DECLARATION

I, Charles Okoe Bosomprah do hereby declare that this dissertation is the result of my own work and carried out under the Supervision of Dr. Richard Anfo-Otu and that to the best of my knowledge no part has been submitted or presented by another person in award of any other degree by the University or any other institution.

.....  
**CHARLES OKOE BOSOMPRAH**

(CANDIDATE)

.....  
**DATE**

### SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the Presbyterian University College of Ghana.

.....  
**DR RICHARD ANFO- OTU**

(SUPERVISOR)

.....  
**DATE**

### DEDICATION

I dedicate this work to my wife Mrs Gifty Joyce Oteng-Bosomprah and my first born child Ebenezer Kwesi Bosomprah.



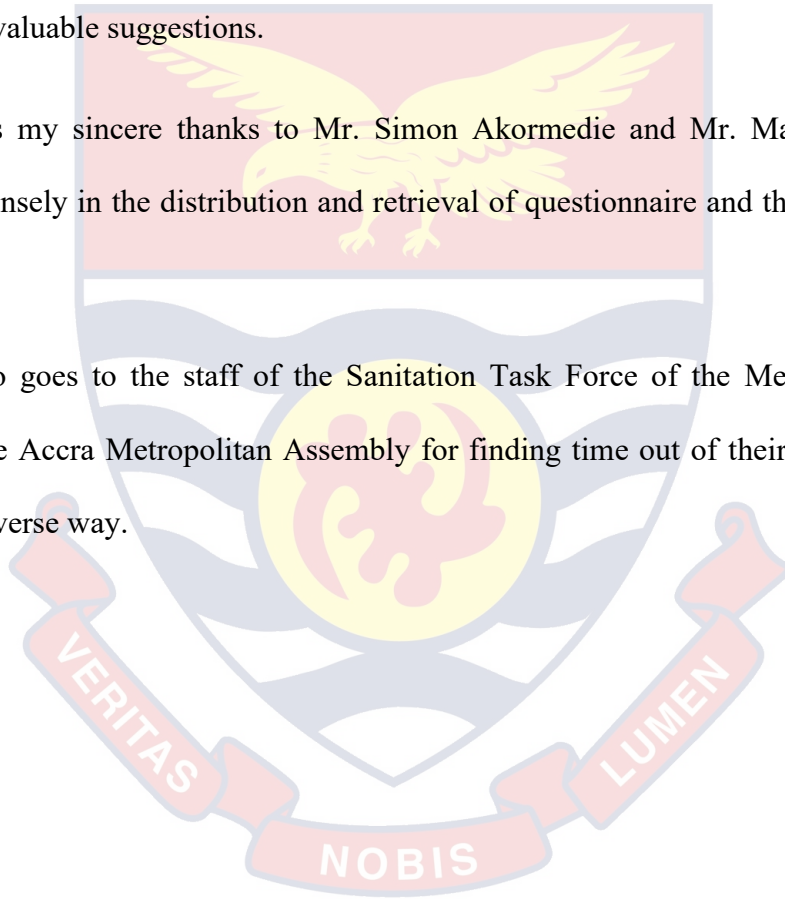
## ACKNOWLEDGEMENTS

I acknowledge God for the strength and encouragement from his word. It is just by his grace that this work has been a success.

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My gratitude also goes to the staff of the Sanitation Task Force of the Metro Public Health Department of the Accra Metropolitan Assembly for finding time out of their busy schedule to assist me in all diverse way.



## ABSTRACT

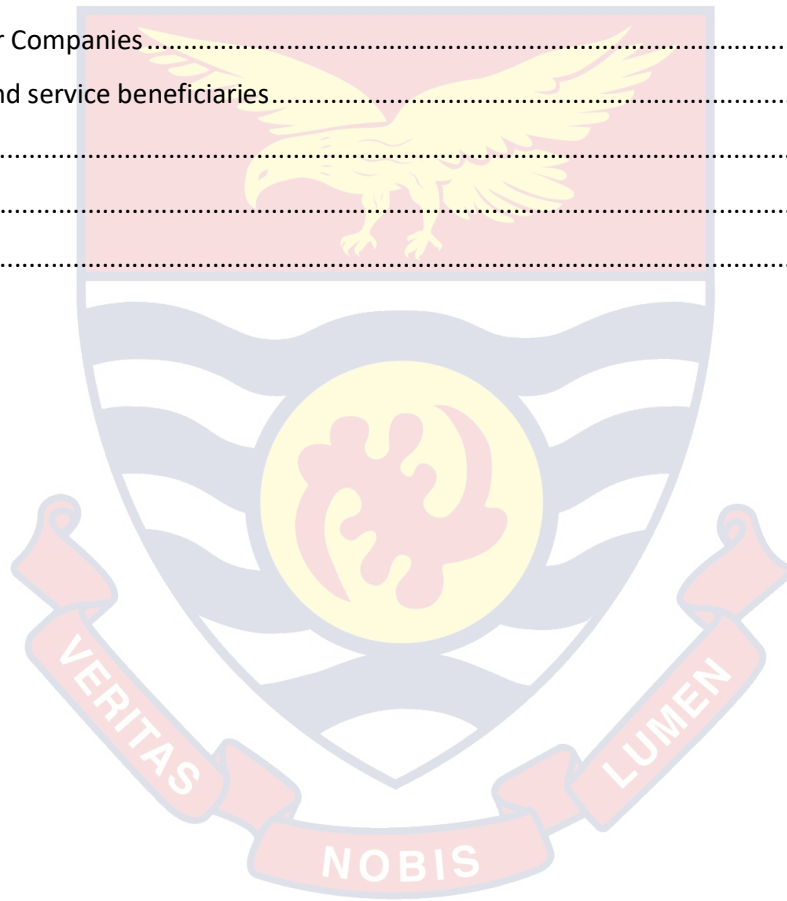
Generally, this research sought to explore the need for proper management of solid waste in its collection, disposal and challenges associated with solid waste Management and find out other processes of waste collected goes through within the CBD and ascertain the effectiveness of the control measures put in place to minimize hazards to make waste management more efficient and sustainable. A sample of 60 respondents including market traders, Kaya Borla operators, junkies, store and shop owners and keepers, community residents, Assembly workers, and private accredited and non-accredited waste collection companies. The structured questionnaire used includes a combination of open and close ended questions and Likert type scale with five options and observation were used to gather information. Results of the study revealed that organic waste, plastic; cardboard or paper are the common types of solid waste generated in the Central Business District of Accra. The study therefore recommend that AMA need to regularize their contractual processes for a reliable waste management company that can provide the required services to the people with the private companies improving their services for efficient waste collection services in the CBD while traders and people in the community be made to register for efficient solid waste collection services.

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### LIST OF ABBREVIATIONS AND ACRONYMS

SCP	- Sustainable Cities Programme
SIDA	- Swedish Development Agency
CBOs	- Community Based Organization
GSS	- Ghana Statistical Service
AMA	- Accra Metropolitan Assembly
CBD	- Central Business District
SWM	-Solid Waste Management
NGOs	-Non-Governmental Organizations
EMP	- Environmental Management Plan
UTC	- United Trading Company
MTTU	- Motor Traffic and Traffic Unit
WMD	- Waste Management Department
MPHD	- Metropolitan Public Health Department
SPSS	- Statistical Package for Social Science

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Waste management over the years have been promoted by certain factors such as human safety, environmental health protection concerns, reduction of environmental waste and resource conservation (McDougall &Hruska, 2000). The waste management system comprises of waste generation, waste composition, and waste collection methods, service coverage and transportation and finally waste treatment and disposal (Asase et. al., 2009). Factors that promote waste management in a particular jurisdiction affect the mode of operation of the waste management system. The city of Accra has been facing numerous challenges in addressing solid waste management in recent times. A number of factors have been mentioned by several actors in the sector.

According to Da Zub et al (2008), solid waste refers to materials of solid nature that has exceeded its use by the first users. He further states that words such as rubbish, refuse, garbage and trash are commonly used to describe solid waste usually produced in households. There are various activities within society which produces waste that can be grouped under organic and inorganic waste. Usually these kinds of waste have lost its value or purpose to its first user. This implies that when further processed could become useful to a secondary user. Solid waste from places such as houses, streets, public places, shops, offices and hospitals can be termed as municipal solid waste. The management of such waste is the duty of municipal or government authorities depending on the jurisdiction (Da Zhu et. al., 2008).

According to Boadi and Kuitunen (2003) uncontrolled urbanization has increased the quantities

of waste being produced daily. This in turn has also put a strain on the waste management system existing in the Metropolis. They further argued that, certain factors account for the difficulty faced by city authorities in the management of refuse, specifically its collection and disposal. These factors include weak institutional capacity and lack of resources which includes both human and capital resources.

Rapid growth rate of population in Ghana is 2.5 % from the 2010, population and housing census (GSS 2010). Greater Accra and Ashanti regions have the highest share of population with 16.6% and 19.4% respectively (GSS 2010). Taking a look at the population growth is necessary for waste management decision making. This implies an increase in the refuse production in the Accra Metropolis from the high income class, middle income and low income class and the need for greater capital input in waste management activities to keep the city clean as indicated by the President, Nana Addo Dankwa Akuffo-Addo.

Boadi and Kuitunen, (2003) also identified that; home collection of refuse has been limited to high class and some middle income class, mostly neglecting the low income class. This is as a result of the fact that the middle income class as compared to the low income class pays for the waste collection and management. This in turn leads to an indiscriminate disposal of waste in various parts of the city such as medium of streets, on pavement, surface drains, canals and streams. This creates an unsanitary and unsightly environment in the Accra Metropolis.

According to Ugwu Uchechukwu (2009), other problems that confront waste management include a lack of implementation of waste management policies and in other cases inadequate waste management policy formulation. There are also financial and operational barriers that inhibit the smooth management of waste. Finally, poor attitude towards waste management by

citizens is also one of the problems affecting the state of solid waste in the capitals of most developing nations.

## **1.2 Problem Statement**

Recently, there has been a public outcry on the environmental hazards associated with the inappropriate disposal of solid waste generated in the Accra metropolis. Radio and Television discussions, including daily newspaper reports have highlighted the inability of the AMA to manage the waste generated satisfactorily. This phenomenon has led to heaps of waste at various areas in the city. Some have indicated that the situation has been so, due to lack of immediate transfer stations and sanitary landfill sites in Accra. Research has not examined the waste management situation in the Central Business District (CBD) and how it is impacting on economic activities of traders, In Accra Metropolis, general clean up exercise are organized once every month as part of the celebration of the national sanitation day. However, it has not yielded the needed result or solves the problem of waste management and proper waste disposal in the Central Business District. The problem still persists in most municipalities with little being done to manage solid waste and especially its collection. Information to understand the nature of solid waste collection system in the Central Business District is lacking and living room for speculations. This study therefore will contribute to address this gap in information and knowledge.

## **1.2 Objective of the Study**

Generally, this research sought to explore the need for proper management of solid waste in its collection and disposal of waste and find out other processes of waste collected goes through within the CBD.

Specifically, the study sought to achieve the following objectives:

1. To examine the arrangements for refuse collection in the Central Business District of Accra.
2. To assess the components of waste management in the Central Business District of Accra.
3. To examine the challenges and prospects of waste management in the Central Business District of Accra.

### 1.3 Research Questions

- What are the arrangements for refuse collection in the Central Business District of Accra?
- What are the components of waste management in the Central Business District of Accra?
- What are the challenges and prospects of waste management in the Central Business District of Accra?

### 1.5 Significance of the Study

The research effort will examine the factors that have led to the poor management and collection of waste and disposal within the Central Business District of Accra and advance recommendations which when implemented will go a long way to help solve the problem of waste management in the Accra Metropolitan Assembly in particular and other Metropolitan, Municipal and District Assemblies in Ghana in general. It is also meant to create awareness within residence, shop owners, market women, and the entire community in and around the CBD generating and disposal of waste is their responsibility. Finally, it is hoped that the study will add

to the search for a solution to the proper operation and management of waste in the CBD, which is of great interest to policy makers, administrators and the general public.

### **1.6 Limitation**

There may be potential loss of data through translation from the local language into English. However, the researcher took conscious steps to ensure minimal loss of information. The researcher employed the forward and back translation method to minimize the loss of data through translation after translation from the local language to the language. Another person was made to translate it back into English. The first English translation and the second one was then compared by the researcher to see the difference in translation and then reconcile them.

### **1.7 Delimitation**

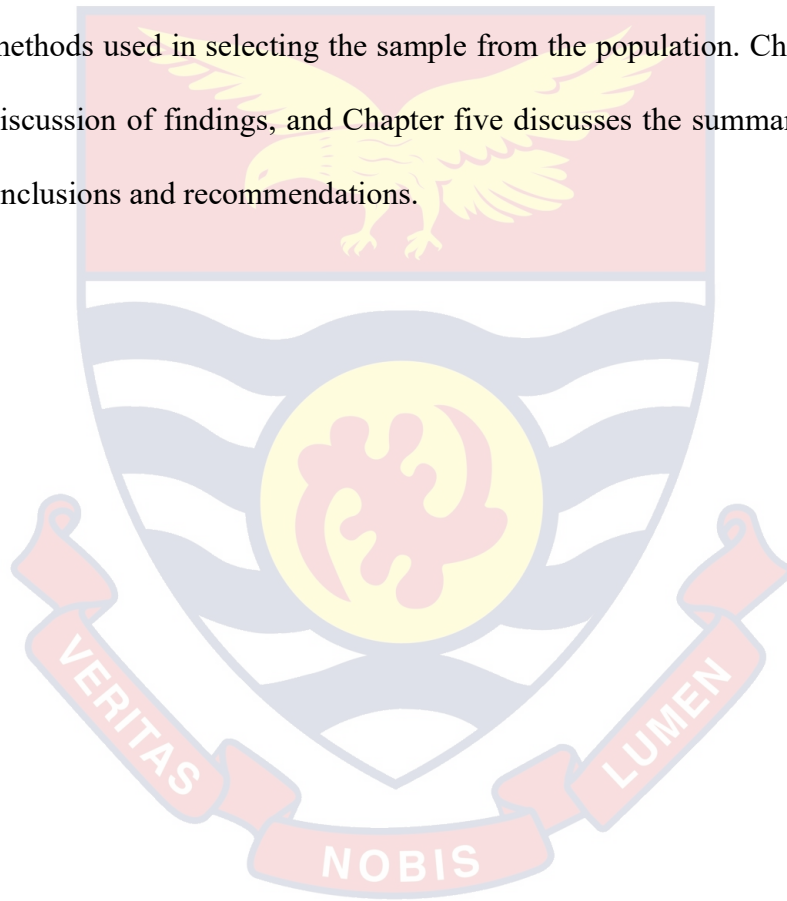
This study will confine itself to interviewing and observing traders selling by the road side and on the streets, shop owners, traders within Mokola market, junkies and Kaya bola operators within the Central Business District because they were believed to generate these refuse but as the research progresses there was the need to include officers or staff of the AMA and the contractors to ascertain the truth in whatever information the research obtain from the generators of the waste within the Central Business District of Accra.

### **1.8 Organization of Study**

The dissertation is organized in five chapters. Chapter one deals with the background and rationale for the study, a statement of the problem, general and specific objectives of the study, statement of research questions and significance of the study limitation and delimitation of the



study and ends with organization of the study. Chapter two deals with the review of literature and conceptual framework related to the topic under study. It considers generation and sources, solid waste management systems, waste management in Ghana and other developing Countries, waste recycling in developing countries challenges of solid waste management in developing countries, its health implication and nuisances associated with poor disposal of solid waste. Chapter three which deals with the methodology discusses the methods used to collect data, sample size and methods used in selecting the sample from the population. Chapter four focuses on analysis and discussion of findings, and Chapter five discusses the summary of findings and presentation of conclusions and recommendations.



## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

#### 2.1 Introduction

This chapter presents findings from other related studies on the topic of study. This is important and it will assist and guide the researcher. The chapter focuses waste management systems and processes, its generation and sources and how waste is managed in Ghana and a few developing countries, recycling procedures and challenges facing the monitoring and supervisory staff of the various stakeholders and those who generate the waste.

#### 2.2 Waste Management Systems and Processes

In the Netherlands, private firms owned contracts to collecting waste from 174 Dutch municipalities, which represent 29 per cent of the population, while 115 municipalities were contracting waste collection services to public waste collecting firms. In collaboration with neighboring cities, 14 per cent of the municipalities undertake a municipal waste collection services. 35 per cent of the population which represents the remaining municipalities collect the waste themselves. (Gradus, Fageda, Bel & Dijkgraaf, 2010).

#### 2.3 Generation and sources of waste

The characteristics of waste and its components determine in most cases the type of treatment or disposal method that can be applied. Solid waste is generated from many sources such as domestic, trade, industrial, hazardous and specialised sources. Domestic wastes, as the name implies, are wastes generated in homes and may consist primarily of vegetables and other putricible matter, paper, metals, textiles, plastics, glass etc. Trade wastes are wastes generated from retail, commercial, and business sources including open markets. They also include paper,

packing cases, vegetables and putricibles, plastics, glass, scrap metal etc. Industrial wastes are solid wastes resulting from industrial processes and may include textile rejects, fish and canning wastes, wastes from demolition and construction activities, and agricultural farm wastes. Specialized wastes on the other hand are radioactive wastes, hospital and pharmaceutical wastes, condemned food, disused vehicles parts and equipment.

## 2.4 Solid Waste Management Systems

Source separation collection has been the preferred choice for collecting waste for the past twelve years. In Beijing City, municipal solid waste is generally separated into kitchen waste, recyclables and other waste at the source. The city of Beijing has six waste transfer stations which aids in the transfer of the waste, compression and separation of the waste to ensure efficient transportation and recycling rate. Another important factor is that the treatment plant is distant from the Beijing city where the waste is generated which helps reduce environmental pollution (Zhen-shan et al 2009). The infrastructure and organizational system of waste management in Nigeria is insufficient (Nzeadibe & Chukwuedozie, 2011).

Using specially built carts, wheelbarrows and head pots, the informal private waste collectors collect waste at a fee. (Meyer, 2008). In the under developed and developing states more than 2 percent of the population are involved in informal waste collection activities. (Medina, 2007). The Oyo State Waste Management Authority in Nigeria resulted from the inability of the government to deal effectively with growing solid waste that is indiscriminately dumped in every corner of the city of Ibadan (Ogu, 2000).

In Accra Ghana, solid waste collection is based on House-to-House or Central Communal Container system, of which both can run by either public sector or private operators. The house

to house systems are used in rich and some middle income areas while the central communal container system are used in the remaining areas of which the Accra Metropolitan Assembly provides the areas with the containers. In the house to house system, residents are obliged to register with the accredited contractor and required to pay a user fee. (Post & Obirih-Opareh, 2002).

Waste production is dependent on several factors which includes the stage of development (Alavi-Moghadam et al., 2009). These factors include socio-economic, climatic and geographical conditions which affect solid waste production in diverse ways. According to Tchobanoglous et al. (1993), there are several elements functional in solid waste management. They include waste generation, waste handling and separation, storage and processing, collection, transfer and transport and then final disposal. Some jurisdiction may include recycling in the process however; there may be variations in the waste management in other places.

According to Alavi-Moghadam et al. (2009), in the city of Rasht, the following challenges still confront solid waste management. They include; increase in areas in terms of population and quantity of waste being produced on daily basis. There is also the challenge of inadequate funds, human resource and equipment this is because in allocation of funds, waste management is not prioritized and therefore receives low funds. Also, household hazardous waste is collected together with solid waste produced at home without separation or segregation and this poses serious problems for waste processing. Plastic waste is also a challenge especially as plastics are used in waste packaging in commercial quantities. Another challenge facing the city of Rasht is the legal provisions on waste management and the need for stringent rules on the implementation of existing laws on waste management. Finally, another challenge they encounter is societal and

management apathy. This is because an effective waste management is the result of combined efforts of municipal authorities and the citizens of which this has not been the case.

Guerrero, Maas and Hoglands, (2013) identified in their study of various cities that some developing cities do not have composting practices of waste management. They also identified that some cities practice open burning of solid waste especially at household levels. They also identified a positive correlation between waste composting and domestic open burning of waste in developing nations. Shekdar, (2009) has also identified that many composting facilities have been shut down due to inadequate monitoring of the quality of waste being produced. The shutdown has also been related to the incompatibility of plant design to the characteristics of solid waste being produced. The author stated that, these factors are related to local available knowledge and the necessary appropriate infrastructure.

Guerrero, Maas and Hogland, (2013) further identified that most of the disposal sites in these developing cities are open dump without appropriate treatment. Besides the disposal sites designated by the municipal authorities, illegal disposal of waste has been identified in places such as rivers, oceans, lakes, drainage channels, empty lots and even roadsides. This makes most developing cities engulfed in waste being produced in huge tonnes. Guerrero, Maas and Hogland (2013) also included in their study recycling of waste as a part of the waste management processes. Their findings suggested that, when citizens get access to information on recycling of waste and its benefits, they are more likely to participate in waste recycling campaigns. The kinds of information regarding recycling of waste include its benefits and how to sort waste at source before collection.

Waste management involves a combined effort of various stakeholders with different fields of interest to play a specific role in shaping the waste management system of a city. Having a

concise understanding of who these stakeholders are and their responsibilities are important steps to creating a robust waste management system in every city. Also, effective communication among stakeholders will create the grounds for a proper functioning of waste management systems for cities of developing countries.

According to UN-HABITAT (2010), lack of political will specifically in the area of awareness creation and dedication among National and Local Government in the effective addressing of municipal solid waste management is a challenge that demands attention.

## **2.5 Waste Management in Ghana**

A study by Oteng-Ababio (2010) revealed that private sector involvement in waste collection in certain selected cities in Accra had an overall progressive improvement of 25%. He further identified that Private Public Partnership also got involved in other areas of waste management such as waste recovery, recycling and marketing. The study identified a lack of recognition of the involvement of the informal sector. Dumpsites are sole operated and handled by the public sector creating an avenue for exploitation for the public private partnership in future according to the study.

Population growth and increase in industrial production of raw material has resulted in high rate of waste generation in our cities and most urban areas and most of our developed world. Furthermore, due to improved living standards, improved healthcare and due to globalization, a number of new waste streams have emerged, especially e-waste and hazardous waste. (UNEP, Division of Technology, 2009) urban

The problem of solid waste management (SWM) is multidimensional and is best appreciated in the light of the rapid urbanization of Greater Accra Metropolitan Assembly. About 660 tonne of

refuse is generated daily in Accra Metropolitan Assembly. Managing it led to a huge financial burden on Accra Metropolitan Assembly as users of Communal Container Collection, constituting about 70% of the entire population, enjoyed free services. Thus, to improve revenue mobilization, a privatization policy was conceived which was also seen as a means to extend coverage. Treatment and disposal of waste, however, remained the sole responsibility of the Waste Management Department. Financial challenges usually encountered by the public sector brought about the involvement of the private sector in effective waste management in Ghana (Oteng-Ababio, 2007). Harnessing the social support, acceptability and participation of the informal industry as well as private sector is key to sustainable Public Private Partnership in solid waste management.

Waste generation encompasses those activities in which materials are identified as no longer being of value and are either thrown away or gathered together for disposal (Momoh and Oladebeye, 2010). According to UNEP (2009), in 2006 the total amount of municipal solid waste (MSW) generated globally reached 2.02 billion tones, representing a 7 per cent annual increase since 2003.

There is a crucial waste stream data still needed to identify the appropriate investment in technology. Under pressure to make strides in environmental health and beautification of the Accra's streets; city managers may be compelled to 'leapfrog' seemingly arduous and superfluous data collection and analysis in favor of "game-changing" technologies. But doing so may come with substantial risk of failure. Given the fact that many municipal authorities in some cities struggle to generate revenue from their local tax bases, they (and their constituents) can ill afford to implement waste management techniques that may be incompatible with their environmental, social and economic contexts (Oteng-Ababio, 2011). Rigorous evaluation of all

waste management options, including efficiencies found in their own backyard in the informal sector is the best way to safeguard against ill-fated investments and toward meaningful advancement in sound Municipal Solid Waste Management in the long-term.

A study by Oteng-Ababio, Arguello and Gabbay (2012) in Accra has revealed that in most cases, even though informal systems of solid waste removal are discouraged rather than appreciated and legitimized by the city authorities; they continue to exist and may flourish hand-in-hand with the formal system. In the main, informal waste collector or 'Kaya Bola' activity (i.e. porters who carry solid waste from residencies, markets, etc. in sacks, baskets, etc. to a dumping/container site for a fee) is not confined only to the low-income neighborhoods but equally prominent and conspicuous in high- and middle-income areas.

## **2.6 Waste Management in Dar es Salaam and Tanzania**

Dar es Salaam is one of the fastest growing cities in the world and has faced big problems with solid waste (Myers, 2005). In the beginning of the 1990's the city became the model city of the United Nation's Sustainable Cities Program,(SCP). The program advocated neo-liberalism and decentralization and the SCP tried to empower urban poor to provide their own services and build local economics in the process. This have been very popular among donors, among others the Swedish development agency (SIDA). The people who advocate SCP see it as a program to raise the effectiveness of inter-agency coordination within states during urban service provision. Other thinks that the decentralization is not questioned at all, and when the state is pulling back, the reliance on foreign aid becomes stronger.

The neo-liberalism led to privatization of the solid waste management in un-serviced areas, and Enterprises took over the operational role. After the introduction of the project, the city became much cleaner and the amount of collected waste increased. The companies and CBOs have



removed the waste from the streets and partnership with scavengers has been successful and a lot of recycling has been made. When the CBOs was kept floating by donors, it was also giving working opportunities. There have been great problems though. The CBOs has not been given certain areas to operate in, but are competing in the rich areas. They also lacked equipment and had problems with households that did not pay. Some thought this system was good and efficient, while others, not least the company's, did not like the system. The success varied in different parts of the city, and it is still a problem that the private operators are only collecting waste in the areas where people pay. Most of the SCP initiatives in Dar es Salaam lasted until 2005 due to donor assistance, even though they were suffering from organizational and management problems. The initiative is spread all over Tanzania, as a basis for urban planning and the importance of stakeholders' role in development has started to be taught in planning schools.

The neo-liberalism and structure adjustment program has led to increased environmental problems in Dar es Salaam according to Myers, and there is no sustainable development in the city. It has been top-down instead of bottom-up as planned and after millions of donor-dollars, very little has actually happened in matter of poverty reduction, increased access to service and better living conditions. Myers does not think that the government, nor the CBOs and NGOs, has lived up to the ideals of EPM. It has been a lot of "performing" partnership, but no practicing. It has all been a play for the donors. The SCP 20 has failed to engage the state apparatus, but also to involve the residents. According to Myers the SCP has been a short term success in Dar es Salaam on the expense of longer term possibilities for reconstructing relationship between residents and local and national state.

Solid waste management in Tanzania's urban areas has received low priority during the years. The local authorities lack funds and do not have the necessary equipment and vehicles to carry out a proper service all the way to disposal sites. It is also a problem with unplanned settlements that lack infrastructure and are inaccessible to vehicles. The lack of service makes residents rely on other methods to disposal their waste, often unethical and detrimental to the environment. In turn, the residents will not pay for the service, making a no service-no payment circle (Urban Authorities Support Unit, 2006).

## 2.7 Municipal Solid Waste Management in India

Rapid industrialization and population explosion in India has led to people leaving villages to cities, which generate thousands of tons of Municipal Solid Waste daily. The Municipal Solid Waste amount is expected to increase significantly in the near future as the country strives to attain an industrialized nation status by the year 2020 (Sharma and Shah, 2005, CPCB, 2004). Poor collection and inadequate transportation are responsible for the accumulation of Municipal Solid Waste at every nook and corner.

The management of Municipal Solid Waste is going through a critical phase, due to the unavailability of suitable facilities to treat and dispose of the larger amount of Municipal Solid Waste generated daily in metropolitan cities. Unscientific disposal causes an adverse impact on all components of the environment and human health (Rathi, 2006, Sharholly et al., 2005, Ray et al., 2005, Jha et al., 2003, Kansal, 2002). Generally, Municipal Solid Waste is disposed of in low-lying areas without taking any precautions or operational controls. Therefore, Municipal Solid Waste Management is one of the major environmental problems of Indian megacities. It involves activities associated with generation, storage, collection, transfer and transport,

processing and disposal of solid wastes. But, in most cities, the Municipal Solid Waste Management system comprises only four activities, i.e., waste generation, collection, transportation, and disposal.

The management of Municipal Solid Waste requires proper infrastructure, maintenance and upgrade for all activities. This becomes increasingly expensive and complex due to the continuous and unplanned growth of urban centers. The difficulties in providing the desired level of public service in the urban centers are often attributed to the poor financial status of the managing municipal corporations (Mor et al., 2006, Siddiqui et al., 2006, Raje et al., 2001, MoEF, 2000). In the present study, an attempt has been made to provide a comprehensive review of Municipal Solid Waste Management for Indian cities to evaluate the current status and identify the problems of Municipal Solid Waste Management. The study also aims at encouraging competent authorities/researchers to work towards the improvement of the present system through suggestions and recommendations

## **2.8 Waste Recycling in Developing Countries**

Informal waste recycling is carried out by poor and marginalized social groups who resort to scavenging/waste picking for income generation and some even for everyday survival. This is widespread throughout urban areas of the developing world and it is reported that up to 2% of the population in Asian and Latin American cities depend on waste picking to earn their livelihood (Medina, 2000). This is an adaptive response to scarcity by disadvantaged populations. Informal recyclers often form discrete social groups or belong to minorities, examples of which include the Zabbaleen in Egypt, Pepenadores, Catroneros and Buscabotes in

Mexico, Basuriegos, Cartoneros, Traperos and Chatarreros in Colombia, Chamberos in Ecuador, Buzos in Costa Rica and Cirujas in Argentina ( Medina& Dows, 2000; Berthier, 2003)

In cities with a formal, municipal waste collection and disposal system, at least four main categories of informal waste recycling can be identified, depending on where and how material recovery takes place. Firstly, Itinerant waste buyers are waste collectors who often go from door to door, collecting sorted dry recyclable materials from householders or domestic servants, which they buy or barter and then transport to a recycling shop of some kind. Apart from their labour, they invest capital to acquire and run a vehicle. This activity is widespread all over the world. China, in particular, is highly dependent on this mode of informal recycling (Li, 2002).

Street waste picking has to do with secondary raw materials recovered from mixed waste thrown on the streets or from communal bins before collection. Municipal waste collection crew deals with secondary raw materials are recovered from vehicles transporting Municipal Solid Waste to disposal sites. This practice is widespread, e.g. in Mexico, Colombia, Thailand and the Philippines. Finally waste picking from dumps requires waste pickers/scavengers sort through wastes prior to being covered. This is often associated with communities that live in shacks, built from waste construction materials, on or near the dump. Scavenging at dumps occurs in cities throughout the economically developing world including Manila, Mexico City, Cape Town, Bangalore, Guadelajara, Rio de Janeiro, Dar es Salaam, Guatemala City and many others (Bernache, 2003).

In Ghana, the government started privatizing Solid Waste Collection (SWC) in order to meet the collection demand of the enormous waste being generated. The privatization is believed to have taken place in the mid-1990s (Baud and Post, 2002).

## 2.9 Handling and Collection of Solid Waste Management

Tchobanoglous et al (1993) cited by Tasantab Jerry Chati May, 2012 explain waste handling to comprise activities associated with managing wastes until they are placed in the containers used for their storage, before collection or return to recycling centres. According to a lecture series delivered by Felicia Chinado Moko 2014 cited Tasanto Jerry Chati May, 2012 on Waste Handling and Collection refer to waste handling as activities associated with managing solid waste until they are placed in the containers used for their storage before collection or return to drop-off and recycling. According to the researcher effects of improper Handling of Waste, Public health contents are related primarily to the infestation of areas used for the storage of solid wastes with vermin insects that often serve as potential disease vectors. By far the most effective control measure for both rats and flies is proper sanitation.

## 2.10 Challenges of Solid Waste Management in Developing Countries

Waste workers are associated to low social status (Vidanaarachchi et al., 2006) situation that gives as a result low motivation among the solid waste employees. Politicians give low priority to solid waste compared to other municipal activities (Moghadam et al., 2009) with the end result of limited trained and skilled personnel in the municipalities (Sharholy et al., 2008). Positive factors mentioned that improve the system are support from municipal authorities (Zurbrügg et al., 2005) and strategic plans for waste management that allows monitoring and evaluating annually the system (Asase et al., 2009).

It is generally regarded that waste management is the sole duty and responsibility of local authorities, and that the public is not expected to contribute (Vidanaarachchi et al., 2006). The operational efficiency of solid waste management depends upon the active participation of both

the municipal agency and the citizens, therefore, socio cultural aspects mentioned by some scholars include people participating in decision making (Sharholy et al., 2008), community awareness and societal apathy for contributing in solutions (Moghadam et al., 2009).

Management deficiencies are often observed in the municipalities. Some researchers that have investigated the institutional factors that affect the system have come to the conclusion that local waste management authorities have a lack of organizational capacities (leadership) and professional knowledge. Besides they concluded that the information available is very scanty from the public domain (Chung and Lo, 2008). The extremely limited information is not complete or is scattered around various agencies concerned, therefore, it is extremely difficult to gain an insight into the complex problem of municipal solid waste management (Seng et al., 2010).

Municipalities have failed to manage solid waste due to financial factors. The huge expenditure needed to provide the service (Sharholy et al., 2007), the absence of financial support, limited resources, the unwillingness of the users to pay for the service (Sujauddin et al., 2008) and lack of proper use of economic instruments have hampered the delivery of proper waste management services. Sharholy et al. (2008) indicated that the involvement of the private sector is a factor that could improve the efficiency of the system.

### **2.11. Managing Solid Waste in Market**

The Waste Management Department (WMD) is the public outfit tasked with the day-to-day collection, transportation and disposal of waste (solid and liquid), public education on waste management, public cleansing and supervision of private contractors engaged by Metropolitan, Municipal and District Assemblies (Oduro- Kwarteng 2011). However, due to lack of funds, limited logistics and personnel, this task has been mostly contracted to private waste

management companies in the country. Currently, the WMD plays the role of facilitation, regulation and monitoring of solid waste management services by private waste management companies. Although there are several private waste management companies in the country, ZoomLion Company Limited has the greatest proportion of the waste management services across the country, including the Wa Municipal Assembly (Monney, et al, 2013).

However, the inability of the Municipal Assembly or any Government Agency to supervise the operations of Zoomlion Company Limited is affecting solid waste management in the Wa Market. Payment for the services of Zoomlion Company Limited to Wa Municipality apart the door to door service and other private organisations or individual contracting Zoomlion, is made at source; the money is deducted from the Wa Municipal Assembly's share of the Common Fund. The Municipal Assembly does not determine or evaluate the operations of Zoomlion Company Limited before payment is made. According to the Municipal Waste Management Department, if the amount that is paid to Zoomlion Company Limited were given to the Department, they would have improved the solid waste management situation in the Wa Market better than what Zoomlion Company Limited is currently doing because 'the Waste Management Department has the technical personnel but lack the financial resources and equipment to manage solid waste whiles Zoomlion Company Limited has the financial resources and equipment but lack the technical personnel'. However, the Municipal Waste Management Department acknowledges that there has been an improvement in solid waste collection in the Wa Market since Zoomlion Company Limited started their operations in the Wa Municipality.

## CHAPTER THREE

### METHODOLOGY

Chapter three of this project deals with the method use in collection of data, the study area and description of population, Data type and source sampling technique and procedures, data collection techniques and the instrument used in the collection, data processes and techniques used for the data analysis.

#### 3.1 Area of Study

The study was conducted at Makola Market area, Rawlings Park, former United Trading Company area, Greater Accra fire service station area, Tudu lorry station, Okaishie, Railway Police station area, Katamanto market and Abuja near Cocoa Marketing Board in the Central Business District in Accra. The Central Business District (CBD) is the hub of major commercial activities within the Metropolis. As the center of commerce, it host some major markets within the Greater Accra Region such as Makola market, Rawlings Park, UTC Area, Katamanto, market etc and on street markets. The Central Business District area starts from the Post office, King Tackie Tawiah round about, the Law school road, Tema station and along the Barnes Road. It then turns along Kinbu road through the MTTU to the Accra Brewery to Kings way building. Some other major economic and social services include; Banking, education, Hospitals, light industrial activities chemical and drug stores, provision, second hand clothing food stuffs and a few households etc. The nature of the Sub-Metro therefore attracts an estimated daily influx of about million people from various walks of life who come into the City for Administrative, Educational, Industrial and Commercial concerns.



**Figure 1: Location and Map of Ashiedu Keteke**



Source: Google Map, 2019

### **3.2 Description of the population**

The Ashiedu Keteke Sub Metro is one of the Six (6) Sub Metropolitan Sub-Metropolitan Assemblies of Accra Metropolitan Assembly and covers a total land area of approximately 2.89 km<sup>2</sup> (1.12 sq mi). It is bounded to the north by Ablekuma Central sub-metropolitan district, to the west by Ablekuma South Sub-metropolitan district, to the east by Osu Klottey Sub-Metropolitan District and to the South by the Gulf of Guinea. (GSS, 2010).

The 2010 Population and Housing Census estimated the population of the Sub-Metro as 117,525 with 13,732 houses and 34,964 households. Using the Greater Accra Growth Rate of 3.1%, it is estimated that the 2018 population of the area stands at 143,768. This situation does not only boost economic activities within the Metropolis but also put a lot of pressure on already heavily burdened infrastructure facilities, coupled with sanitation challenges. (GSS, 2010).

### 3.3 Data type and Source

Collection of data was conducted using primary data collection from supervisory staff of the Waste Management Department and staff of Zoomlion, the staff of Trash Masters the current waste contractor within Okaishie Area and Staff of AMA who collects refuse dumped by the road side and medium of the street from Kingsway to Railway station, UTC and streets in the Central Business District to the final disposable sites. The second group falls on Truck pusher of the Katamanto Market and Abuja market near Cocoa Marketing Board area, market women, traders from Nsawam and beyond coming to the business center to sell their wares from 1.00 am to 7.00 am and those who came to the business center from 7.30 am to 8.00 pm. The project also used the secondary data collection techniques from relevant documents, journals etc

### 3.4 Sampling techniques

The Head of the Waste Management Department, Metropolitan Public Health Department, Accredited Waste Contractor (Meskworld waste company,)the Trash Masters, and operational staff of AMA, market women, traders, and Kaya bola / Junkies were purposively selected. The questionnaire was administered to them to solicit information on Monitoring and supervision of staff of the WMD, MPHD, Trash Master and AMA working in the CBD and were also interviewed on mode of collection and the competency of the accredited waste contractor and challenges they encounter and how they manage waste and environmental hazards associated with collection of waste. .

### 3.5 Instrumentation

A combination of different data collection techniques which complemented each other was used to maximise the quality of the data and reduce the chances of bias. The instrument consisted of a questionnaire designed by the researcher. This was chosen because it permits anonymity and

results in a more honest response. A separate questionnaire was designed for the monitoring and supervisory staff at the WMD, MPHD of the AMA and the accredited waste contractor. The format was in two parts. The first part consisted of the background of respondents. The second part was made up of questions to solicit information based on the objectives of the study, on preliminary consultation and works, on waste components, and how waste was collected, stored, managed and challenges and environmental hazards associated with the operations and management of waste within the CBD and fine solutions to the problem.

The second set of questionnaire was designed for clients of the accredited waste company, Market women, traders, Kaya Bola operators Junkies etc and residents in the CBD. The format was also in two parts. The first part consisted of the background of respondents. The second part was made up of questions to solicit information how waste should be collected, stored, managed and find out challenges and environmental hazards associated with the operations and management of waste contractor within the CBD and fine solutions to the problem.

The structured questionnaire using a combination of open and close ended questions and Likert type scale with five options were employed. The questionnaire was distributed to be filled by literate population while trained research assistants assisted illiterate population within the sample residing area within the CBD using it as an interview guide.

Two research assistants were engaged and trained for one (1) day to assist in the data collection. The training focused on the rationale for the study, sampling procedures, and the need for the collection of adequate and reliable data to enhance the quality of the research work.

### **3.6 Data Collection Method**

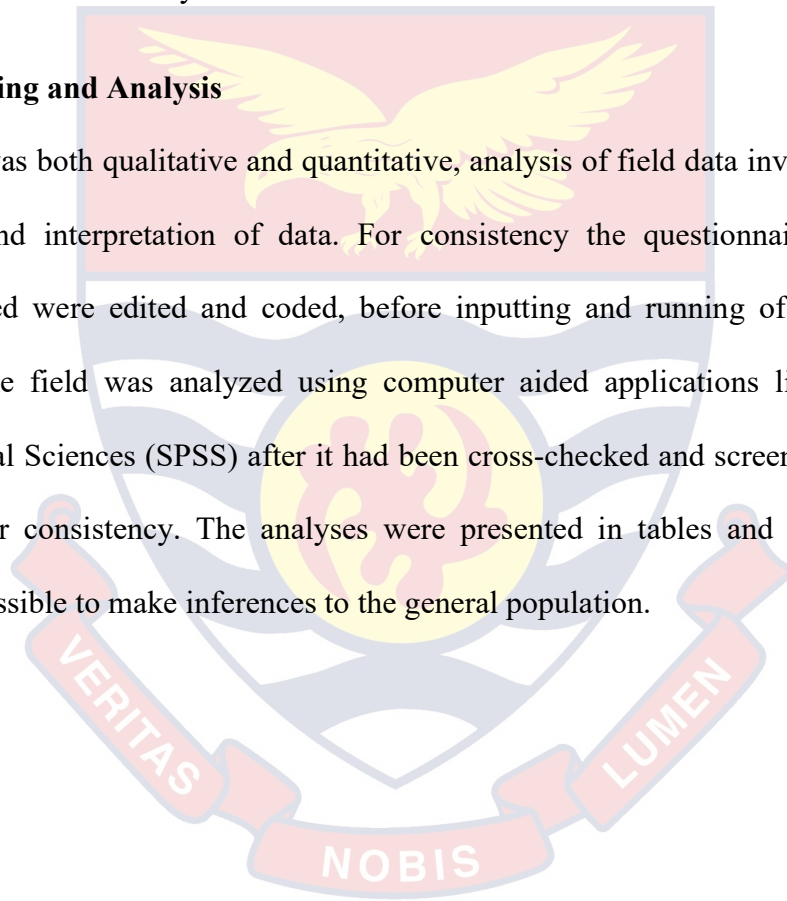
The type of data collection method employed to collect the data was the semi-structured interviews guided by an interview guide. While data collection was ongoing between July and

August, 2019, permission was sought from participants to audio record the interviews in order to allow the researcher to focus on participants without distracting them.

The languages used include English, pidgin, twi and Ga. The interview guide was pre-tested and the necessary changes made before beginning the actual interview were held at all locations and the time agreed upon by both the researcher and the participants at the participants place of work and home within the community.

### **3.7 Data Processing and Analysis**

Since the study was both qualitative and quantitative, analysis of field data involved description; summarization and interpretation of data. For consistency the questionnaire and interview schedules received were edited and coded, before inputting and running of the results. Data obtained from the field was analyzed using computer aided applications like the Statistical Package for Social Sciences (SPSS) after it had been cross-checked and screened in the field by the researcher for consistency. The analyses were presented in tables and percentages. This would make it possible to make inferences to the general population.



## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1 Introduction

This part of the dissertation involves the presentation of results of the data collected and discussions of findings. The chapter cover different areas including the background of respondents made up of residents (people living the area), shops, market women, kaya bola operators and Junkies, waste management staff of the AMA, MPHD TRASH Masters Zoom Lion.

#### 4.2 Sex Background Information about the respondents

The sex background of respondents in Table 1 shows that great number (65%) of those who participated in the study were males and about one-third (35 %) of the respondents were females.

**Table 1: Sex distribution of respondents**

Sex	Frequency	Percent
Male	39	65.0
Female	21	35.0
<b>Total</b>	60	100.0

Source: Field data, 2019

#### 4.3. Religious background of respondents

The religious background of respondents in Table 2 shows that most (75 %) were Christians and about a quarter (25%) was Muslims. The other forms of religion were not represented though it was not intentional, those people may be part of the traders in the business district. The religious

affiliation is key since most of the religious groups believe in good sanitary practices as it is relate to godliness.

**Table 2: Religious background of respondent**

Religious	Frequency	Percent
Christian	45	75.0
Moslem	15	25.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.4. Marital Status of respondents

The marital status of respondents in Table 3 shows that majority (70.0 %) of the respondents are married and responsible people, one-fifth (20.0%) are single and the rest (10.0%) are divorced. This implies that the respondents are mostly matured and understand the need for proper sanitation in their homes which should be applicable to their work areas such as the Central Business District.

**Table 3: Marital status of respondent**

Marital Status	Frequency	Percent
Married	42	70.0
Single	12	20.0
Divorced	6	10.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.5. Educational Background of respondents

The educational background of respondents in Table 3 above shows that the traders have varied levels of education which is likely to influence their waste management practices. One-fifth (20.0 %) of them have had no formal education, 20.0 % had been to Junior Secondary School, and 30.0% had attained Senior High School education level while 10.0 % have had Polytechnic education and 20.0 % had attained university education. This gives a broad spectrum of views or opinion from respondents on their perception about waste collection in the Central Business District of Accra.

**Table 4: Educational levels of respondents**

<b>Educational Background</b>	<b>Frequency</b>	<b>Percent</b>
JSS	12	20.0
SHS	18	30.0
Polytechnic	6	10.0
University	12	20.0
None	12	20.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.6. Number of Children of Respondents

The results in Table 5 show that most (80.0%) of the respondents have children ranging from one to seven in number with only 12 (20.0%) not having children. This implies that majority of them are responsible people and would work to take care of themselves or their families. Those seen

as “Kaya Bola operators” and those people classify as “Junkies” may be in the waste business to earn an income to meet their basic human needs.

**Table 5: Number of Children of respondents**

<b>Number of Children</b>	<b>Frequency</b>	<b>Percent</b>
1-2	12	20.0
3-4	24	40.0
5-6	9	15.0
7 and above	3	5.0
None	12	20.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### **4.7. Length of Stay of Respondents in the CBD**

Table 6 represents the length of stay of respondents in the businesses they do. One-fifth (20.0 %) have worked in the CBD area between 1-5 years, 35.0% between 6-10 years, and the rest have stayed in the area for more the 10 years. This means the respondents could have fair knowledge and experiences of issues concerning the collection, management and operations of the waste companies assigned to the area and their responses would be valid.



**Table 6: Length of Stay of respondent in CBD**

<b>Length of stay in Business</b>	<b>Frequency</b>	<b>Percent</b>
1-5 years	12	20.0
6-10 years	21	35.0
11-15 years	6	10.0
16 years and above	21	35.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### **4.8. Waste Management Companies operating within the area**

On the issue of which waste company is involved in waste management in the CBD, 6 (10.0 %) of the respondents agreed that AMA is responsible for waste management in the CBD while 17 (28.3%) agreed that Trash Master is responsible for waste management in the CBD as shown in Table 7. Moreover, 6 (10.0 %) say its Zoomlion and 15 (25.0 %) believed none of the institutions mentioned are responsible for waste management in the area. These revealed that some people in the CBD are aware that Trash Masters is the company assigned to the area by AMA but majority (71.7%) was not aware.

**Table 7: Waste management companies operating within the CBD**

Waste Company	Frequency	Percent
AMA	6	10.0
Meskworl	16	26.7
Trash Masters	17	28.3
Zoomlion	6	10.0
None of these	15	25.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.9. Waste Management Services rendered to respondents in the CBD

The arrangement looks at the system in place to safely collect and transport the waste to final disposal site. On the issues concerning services rendered by the waste company in the CBD, it is clear in the minds of majority (65.5%) of the traders in the area that the waste company assigned to the area is required to do janitorial services in addition to collection of waste (see Table 8). According to them, before the commencement of the operation of the company managing waste in the area, AMA made an announcement for almost ten days to create awareness. This means that when new companies are assigned to provide services in a franchise area, it is important for the Assemblies to announce and inform the service beneficiaries to know the kind of services expected from the service provider. Those who gave different responses either did not hear well the announcement or were not present during the period, since most of them have been working

in the area for more than 5 years, or it could be those who have been working in the area less than five years.

**Table 8: Waste Management Service rendered to respondents in the CBD**

<b>Waste Services</b>	<b>Frequency</b>	<b>Percent</b>
Waste Collection	9	15.0
Waste Collection & Janitorial	39	65.5
None of these	12	20.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### **4.10. Refuse Collection Intervals**

On the interval for waste collection or waste collection frequency, it emerged that majority (85.0%) of the respondents indicated that it is done on daily basis as shown in Table 9. This is so because the Central Business District is a very busy place and waste generation tend to increase on daily basis, therefore if collection is halted in a day it will create a big disaster. Only 9 (15.0%) of respondents who says none of the above were either not aware of the collection frequency or they have not been handing over their waste to the waste collection company and as such might be dumping on the street or using the services of the informal waste collectors.

Since the waste is sent to landfill at far away distance to Kpone (about 40 Km) from the CBD, it affects the frequency of collection and service coverage. This is one of the major challenges of waste management in the CBD.

**Table 9: Refuse Collection Intervals**

Refuse Collection Intervals	Frequency	Percent
Daily Basis	51	85.0
Every other day	0	0.0
None of these	9	15.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.11 Who Dump Refuse

Dumping of refuse in front of stores, median of the road and by the road side in the CBD is a major problem. From Table 10, majority (72.7%) of the respondents indicated that Kaya Bola operators and Junkies are those who actually dump refuse elsewhere in the CBD. Accordingly, information from the Waste Management Department indicated that after two months of arrest and operation by the Task force, the load or weight of refuse collected daily reduced drastically.

**Table 10: Who Dump Refuse**

Refuse Dumping	Frequency	Percent
Waste Contractors	3	9.1
AMA	3	9.1
Kaya Bola/Junkies	24	72.7
None	3	9.1
<b>Total</b>	<b>33</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.12. Checks put in place

Although the MPHD has put in place a night patrol team to arrest people who dump refuse elsewhere, those who dump elsewhere are always vigilant and at times escape without being caught. From the table 11 majority of respondents 33 (55%) were in the known that junkies or Kaya Borla operators are at times arrested and sent to court or sent to the AMA office. Those who were not aware are respondents who are mostly indoor in their stores and do not know what happens on the streets around the CBD.



**Table 11: Checks put in place**

Checks	Frequency	Percent
Arrest, Send them to AMA	33	55.0
None of these	18	30.0
Missing system	9	15.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.13. Type of Waste Management Vehicle

On the issue of the arrival of the refuse truck in the CBD, looking at Table 12, majority of the clients in the CBD (60.0 %) says that the compactor truck is supposed to pick refuse within the CBD at 6.00 pm every evening when the sweepers start work while 25.0% says the articulator which gets there around 2.30am. Information gathered indicates the distance from where they are and the refuse truck is just too far and that at times they do not come to pick the refuse.

**Table 12: Type of Waste Management Vehicle**

<b>Waste Vehicle</b>	<b>Frequency</b>	<b>Percent</b>
Compactor	36	60.0
Articulator Truck	15	25.0
Tricycle	3	5.0
Ten Wheeler Truck	3	5.0
None of these	3	5.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### **4.14. Composition of Waste generated within the CBD**

In the CBD waste composition of the area is dominated by organic, plastic and cardboard or paper. The respondents gave varied view as shown in Table 13 with majority of them (66.7%) indicating organics followed by cardboards or papers, which conform to what is usually known. This is so because a lot of food stuffs are sold with packaging materials which are predominantly card board, papers and plastics. Other type of waste may be generated but the respondents have been seeing more of the components they have indicated.

**Table 13: Waste Composition generated within the CBD**

Waste Composition	Frequency	Percent
Organics	40	66.7
Papers/cardboard	12	20.0
Plastics	8	13.3
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.15. Waste Segregation

Table 14 shows that waste segregation is not practiced within the entire CBD. There is a private contractor who deals in collection and purchase of cardboard or paper for recycling into other useful items. However according to most respondents, waste segregation cannot be practiced in the area because it's a market center. Their reason is that they have no space to put the waste bins and even if they have, the space the bins are at a risk of theft. This means that if segregation is done, these components could be useful for the recycling industry and compost production.

**Table 14: Waste Segregation in the CBD**

Waste Components	Frequency	Percent
Organics	56	93.3
Papers/cardboard/ Plastics	4	6.7
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.16. Keeping Refuse before collection

Within the CBD there is always a challenge with where to store the waste before collection. A look at the Table 15 shows that half of the respondents (50%) in the CBD store their waste outside of their stores prior to collection, 15% stores them in cardboard with only 5% storing them in 240 litre waste bins. Though the company providing service in the area is supposed to provide waste bins to the clients, most of them have not received the waste bins which is accounting for dump outside their stores and use of card boards.

Some of the prospects in the area were identified to include: possibility of having plastics, papers and organic waste to feed various forms of recycling companies to create business and job opportunities for unemployed youth especially in the CBD; employing youth to monitor illegal waste dumpers for arrest and prosecution to deter others , generate income for the AMA and create employment for those engaged; most people are ready to pay for waste collection services since it is not monthly but are collected on either daily or weekly basis.

**Table 15: Keeping Refuse before Collection**

Keeping Refuse	Frequency	Percent
In a 240 container	3	5.0
In a card board Container	9	15.0
Outside the store	30	50.0
None of these	18	30.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019



#### 4.17. Janitorial work before Collection

From the Table 16, information from respondent indicates that the contractor is supposed to do Janitorial job as well as collect refuse to the final disposable site. The others are those who have refused to register with the contractor.

**Table 16: Janitorial work before collection**

Janitorial Work	Frequency	Percent
Sweeper or Waste Contractor	21	63.6
Kaya Bola	6	18.2
Junkies	3	9.1
Hire Somebody	3	9.1
<b>Total</b>	<b>33</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.18. Waste Collection Services

The collection services have been provided by both the formal company and the informal waste collectors in the CBD. From Table 17, most of the respondents (45.4%) goes for the sweeper and contractor, the “Kaya bola” had 18.2% likewise the Junkies and those who were hired to pick the refuse.

**Table 17: Waste collection Services**

<b>Waste collection Service</b>	<b>Frequency</b>	<b>Percent</b>
Sweeper or waste contractor	15	45.4
Kaya Bola	6	18.2
Junkies	6	18.2
Hire somebody	6	18.2
<b>Total</b>	<b>33</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.19. Registration for collection of refuse

On registration with the accredited waste contractor, according to the respondents, the problem of none registration by people in the area, the revenue and officers of the accredited waste contractor in the first place have no office and fail to come to them or even leave their contact lines to enable them get in touch when they need them. This means that they have a poor customer care practice which is depriving them of clients. Out of the 33 valid responses, only six (18.25) have of the respondents have registered with the accredited waste collection company for the CBD, 27.3% each have registered with Meskworld, Kaya Bola operators and the same number 9 (27.3%) have not registered at all as depicted in Table 18.

**Table 18: Registration for collection of refuse**

Registration	Frequency	Percent
Meskworl	9	27.3
Trash Master	6	18.2
Kaya Bola	9	27.3
None	9	27.3
<b>Total</b>	<b>33</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.20 Refuse Collection points

According to respondents Table 19 below, 45.0 % says refuse container is needed in the area and also 20.0% says the collection point is too far while 25.0 % says none of the two. According to the respondent if the container is brought nearer the area it will stop people dump refuse by the road side and on the medium.

**Table 19: Refuse collection points**

Waste Collection points	Frequency	Percent
Refuse container needed in the area	27	45.0
Collection point is too far	12	20.0
None	15	25.0
Missing system	6	10.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019

#### 4.21 Waste Collection Charges

Table 20 indicate that majority (55.0%) of respondent confirmed that they pay one Ghana cedis daily (GH¢1.00) and pay Six Cedis (GH¢6.00) to the contractor on weekly basis for services delivered. It was indicated that the charge is reasonable and that everybody should be able to pay to enable the contractor to deliver the services. Those using the informal sector waste collectors indicated that (40.0%) of respondent pay two to five cedis (GH¢2.00- GH¢5.00) daily depending on the weight of refuse to be collected by the Kaya bola operators and the junkies.

**Table 20: Waste collection charge**

Waste Collection Charge	Frequency	Percent
One Cedis on daily basis	33	55.0
2 – 5 Cedis on daily basis	24	40.0
None	3	5.0
<b>Total</b>	60	100.0

Source: Field data, 2019

#### 4.22. Time of Refuse Collection

On the issue of the time for collection of refuse, Table 21 shows that most (70.0%) of the respondents are aware that waste is collected from 6.00pm by the compactor truck, 20.0% of respondent are also aware that the articulator truck come to park at the railway junction by 2.30 am and only 10.0% does not know the time. This means majority of the population in the CBD are very sure of the time for the collection of refuse, because the collection is after they have

closed their shops and early in the morning the shop owner agreed that they left the collection of the refuse to the dump site for the Kaya bola or the junkies to do the dumping for them.

**Table 21: Time of refuse collection**

Refuse Collection Time	Frequency	Percent
2.30 am	12	20.0
6 pm	42	70.0
None	6	10.0
<b>Total</b>	60	100.0

Source: Field data 2019

#### 4.23. Arrest and prosecution of offenders

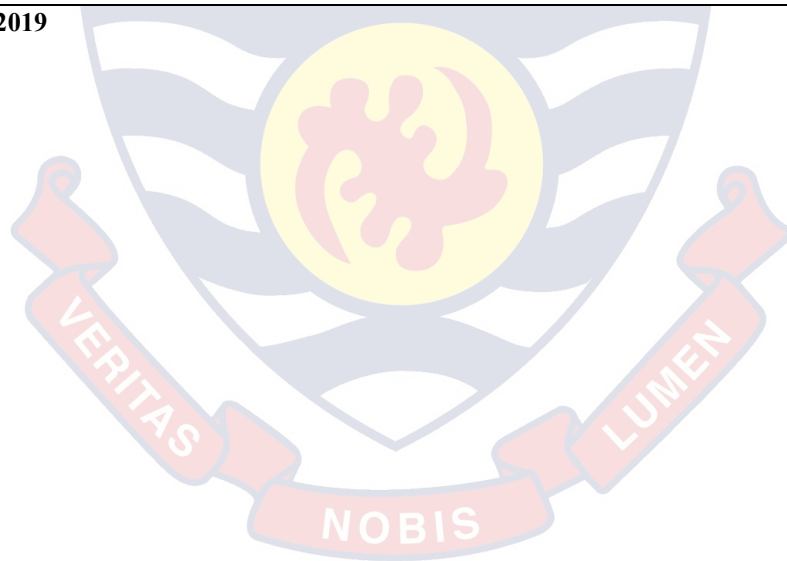
Table 22 shows that majority (90.0%) of respondent are aware that the AMA Mobile Sanitation Taskforce Team is tasked with the arrest of people dumping refuse elsewhere, 5.0 % says it is the AMA Task Force whilst 5.0% says none of the two. Since most of the people are aware of those who are effecting the arrest, they normally hide at the blind side of the taskforce and the sanitary inspectors.

The other challenge is that how to chance on those who dump at the unauthorized places or getting the offenders arrest them and prosecute them at the law court to serve as deterrent to others from dumping on the roads and drains.

**Table 22: Arrest and prosecution of offenders**

<b>Arrest</b>	<b>Frequency</b>	<b>Percent</b>
AMA Task Force	3	5.0
AMA Mobile Sanitation Task Force Team	54	90.0
None	3	5.0
<b>Total</b>	<b>60</b>	<b>100.0</b>

Source: Field data, 2019



## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Introduction

This chapter summarises the entire research process as well as the results of the study undertaken and conclusions drawn from the findings. It also prescribes recommendations for possible solution to the challenges identified by the research. Specifically, the study sought to achieve the following objectives:

- Examine the arrangements for refuse collection in the Central Business District of Accra.
- Assess the components of waste management in the Central Business District of Accra.
- Examine the challenges and prospects of waste management in the Central Business District of Accra.

To achieve the stated objective, data was collected from traders, shop owners and workers, Junkies, Kaya Borla operators and residents; (all people living within the CBD) accredited waste contractors, and AMA staff in charge of operations (MPHD) and monitoring of waste contractors (WMD).

#### 5.2. Summary of findings and conclusions

The fact that dumping refuses elsewhere on our street impact negatively and possesses numerous problems and challenges to the communities, Assemblies and onto the environment. This dissertation is to examine the arrangements for refuse collection in the Central Business District of Accra. It was also to assess the waste components and examine the challenges and prospects of waste management in the Central Business District of Accra.

From the study it came out clearly that although there was an accredited waste company in charge of the area, in a way his contract has been abrogated verbally for want of not performing. The company is therefore registering subscribers and servicing them. About four companies are involved in lifting waste in the commercial business district area of the Metropolis.

From the study it came out clearly that the accredited waste company lack personnel, feel reluctant to go and collect the revenue and failed to register none clients of the company who falls under their area of jurisdiction. The study also revealed that the company failed to create awareness to enable the community know that refuse created by them must be paid for and that it is their responsibility to pay.

In the course of study it was revealed that AMA failed to assigned a contractor to the Agbogloboshie second hand dealers market area near the railway station and the market nearer the Cocoa Marketing Board. It was realized that, where most of the Junkies and the Kaya bola operates mostly.

The study also revealed that the contractors have no uniform for their technical staff as well as sweepers. The mobile task force at times take some of these sweepers for either junkies or kaya bola operators they are arrest until the next morning when their heads come to confirm that they are worker of the Meskworld company, the Trash Masters or Zoom Lion.

Lastly the study revealed that most waste generated are from the traders who sell their goods and commodities on the streets, pavement and from the vehicles that park and alight passengers at a very small space provided as a bus stop at Kingsway and railway bus stop that attract passengers to these point. This dissertation is of the view that AMA should adhere and work on the prescribed recommendations for possible solution to the challenges identified by the research.



### 5.3 Recommendations

The study has made a number of recommendations to be considered by the stakeholders dealing with solid waste management in the Central Business District of Accra Metropolitan Assembly.

#### 5.3.1 For the Accra Metropolitan Assembly

1. AMA should regularize their contractual processes to look for a reliable waste management company that can provide the required services to the people devoid of politics.
2. Register and regularized the services of informal waste collectors using motor king to provide services to traders in the market areas so that they will not contribute to the littering and heaping of refuse on the main streets during the nights.
3. Staff of the AMA should be made to register and collect revenue from all the traders in the area for waste collection services so that the private companies could focus on the services delivery. They shall however, be paid by the AMA based on agreed payment schedule terms in the contract.
4. AMA should embark on serious and continuous education and awareness creation on waste management services and responsibilities of waste generators in the CBD using the media (print and electronic), information service unit of the Assembly and the Environmental Health Unit to help sensitize the people and also enforce the sanitation bye-laws. Offenders of these provisions should be identified and prosecuted to serve as deterrent to others.

#### 4.3.2 Private Sector Companies

5. Private companies providing waste collection services in the CBD Should improve their services delivery; adopt measure to protect their workers including provision

of uniforms. They should also absorb and register the informal collectors in their operational areas into their staff for proper supervision and monitoring.

### 5.3.3 For traders and service beneficiaries

6. Finally, all traders and service beneficiaries should register and pay the approved fee for solid waste collection services to ensure regular cleaning and evacuation of waste from the CBD and prevent heaping of waste on the streets.



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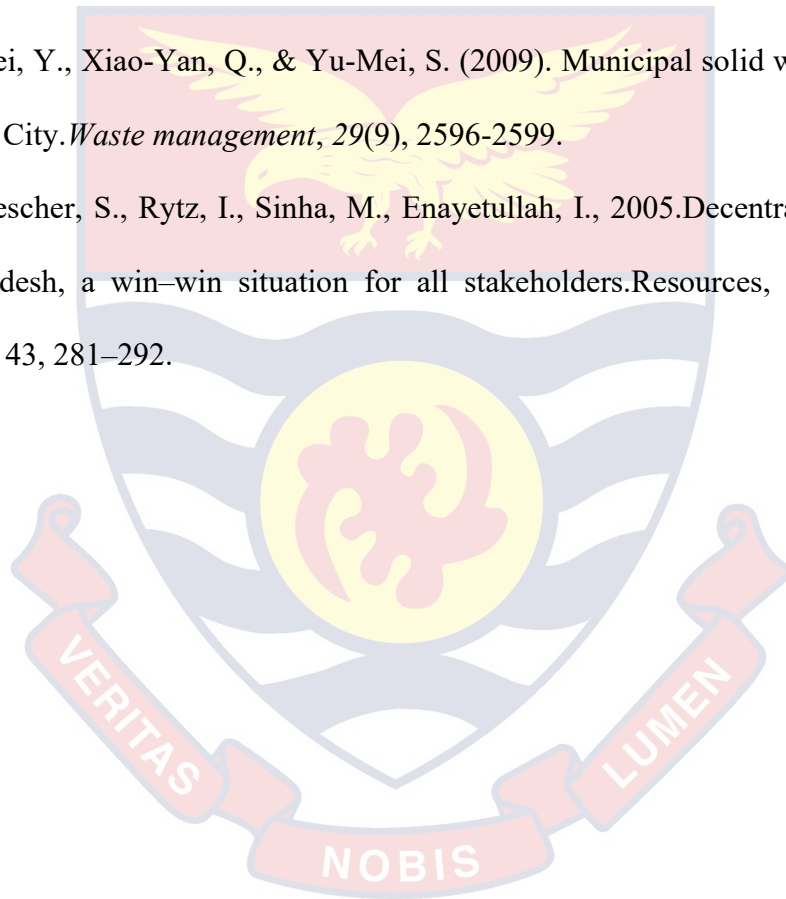
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**APPENDIX “A”  
PRESBYTERIAN UNIVERSITY COLLEGE**

**INTERVIEW GUIDE FOR MANAGEMENT (WMD, MPHD, WASTE  
CONTRACTORS)**

I am Charles Okoe Bosomprah, a student of the Presbyterian University College of Ghana conducting a research. The purpose of this study is to explore the waste management systems available within the Central Business District of Accra.

This questionnaire is to find out about their operations and management of waste and find out why people dump waste elsewhere on the streets, by the medium of the streets, and in the drains. The questionnaire is also to find out waste disposal and collection systems and challenges in the Central Business District. The outcome of the study will help implement existing policies on waste management and also create new ones.

I would be glad if you can respond to these questions by sparring some few minutes of your time. Any information given will be treated as confidential and used solely for the intended purpose.

**Demographic Data**

1. **Sex:**       (a) Male       (b) Female
2. **Occupation** .....
3. **Religion**  
      (a) Christian       (b) Moslem       (c) Traditionalist (d) None
4. **Marital status**  
      (a) Married       (b) Single       (c) Divorced



**5. Educational background**

- (a) JSS (b) Secondary School/SSS (c) Polytechnic (d) University

**6. Number of children**

- (a) 1 – 2 (b) 3 – 4 (c) 5 – 6 (d) 7 and above

**7. Length of stay in business**

- (a) 1 – 5 years (b) 6 – 10 years (c) 11 – 15 years (d) 16 years and above

**Waste Management Authority**

**8. Who is the Accredited Waste Contractor in charge of waste management in the central business district?**

- (a) AMA (b) Trash masters (c) Zoom Lion (d) None of this

**9. What kind of monitoring system are in place to check the activities of waste collection by illegal waste collectors in the CBD**

.....

**10. What are the existing bureaucracies involved in waste collection in the central business district**

.....

**11. Which waste management company is directly involved in waste management in the central business district**

- (a) AMA (b) Trash masters (c) Zoom Lion (d) kaya bola/Junkies (e) None of this

**12. What kind of punishing systems have been put in place to check the activities of dumping waste elsewhere in the CBD?**

- (a) Arrest and send to court (b) Pay cost of abatement (c) Arrest and caution (d) None of this

13. What is the average age of people who dump refuse elsewhere or incarceration?

- (a) 18 – 25 years (b) 26 – 30 years (c) 31 – 40 years (d) 41 years and above

14. What punishment is given one by the court for dumping refuse elsewhere in the CBD?

- (a) Caution & discharged (b) 1-3 months (c) 4 – 6 months (d) 7 – 12 months (e) 2 – 3 years

15. Which of the waste management vehicle is used to cart refuse to the final disposal ground?

- (a) Compactor (b) Articulator truck (c) Tricycle (d) Ten wheeler truck (e) None of this

16. What arrangements are you putting in place for waste management within Agbogloboshie

(June 4<sup>th</sup> Area) and Cocoa Marketing Board Market within the CBD

.....

.....

**Waste Management Component**

17. What goes into waste management in the Central Business District of Accra?

- (a) Organic /plastic waste (b) Card board /Plastic (c) Organic /Plastic / Card box container  
(d) None of this

18. How is plastic waste and organic and paper waste in the Central Business District of Accra?

- (a) Segregated (b) Plastic is Picked (c) All waste is collected together (d) None of this

19. What forms of waste segregation do you employ in the Central Business District of Accra?

- (A) 2 way (Organic and Plastic Waste bin) (b) 3 way ( Organic, Plastic and Paper waste bin)  
(c) None

20. Where is refuse kept before collection to the final disposal sites?

- (a) In a 240 lit container (b) In a 120 lit container (c) In a Card board container (d) None of this

21. What other information on waste management in the CBD can you share with me that I have not asked you?

.....  
.....

### Waste Collection

22. What kind of services does the waste management company render to clients in the CBD?

(a)Waste collection only (b) Janitorial (c) Janitorial & Waste Collection (c) None of this

23. On what basis is refuse collected by the waste contractor

(a)Daily basis (b) fortnightly (c) weekly basis (d) monthly basis (d) None of this

24. Which type of the waste containers are contractor supposed to supply to clients

(a)120 liter container (b) 240 liter container(c) Improvised rubber container(d) Card board container (e) None

25. How often is the refuse truck supposed to pick refuse from the CBD?

(a).Daily (b) . Fortnightly (c) Weekly (d). Monthly as and when it is full

26. What is the official rate is charge for collection of waste by the waste contractors from clients within the Central Business District

(a)1-5 Cedis (b) 6-10 Cedis (c) Something small (d) Carry for food (e) None

27. Which Department within the AMA is charged with the arrest of people who dump refuse elsewhere within the CBD

(a)AMA Task Force (b) AMA Night patrol team (c) Police Patrol Team (d)None

28. At what time is the refuse truck supposed to pick refuse within the CBD?

(a) 2.30 am (b) 10.00 pm (c) 6.00 pm (when the sweeper start work) (d) None

### Challenges Affecting Waste Management

29. What are some the challenges you encounter in managing municipal waste?

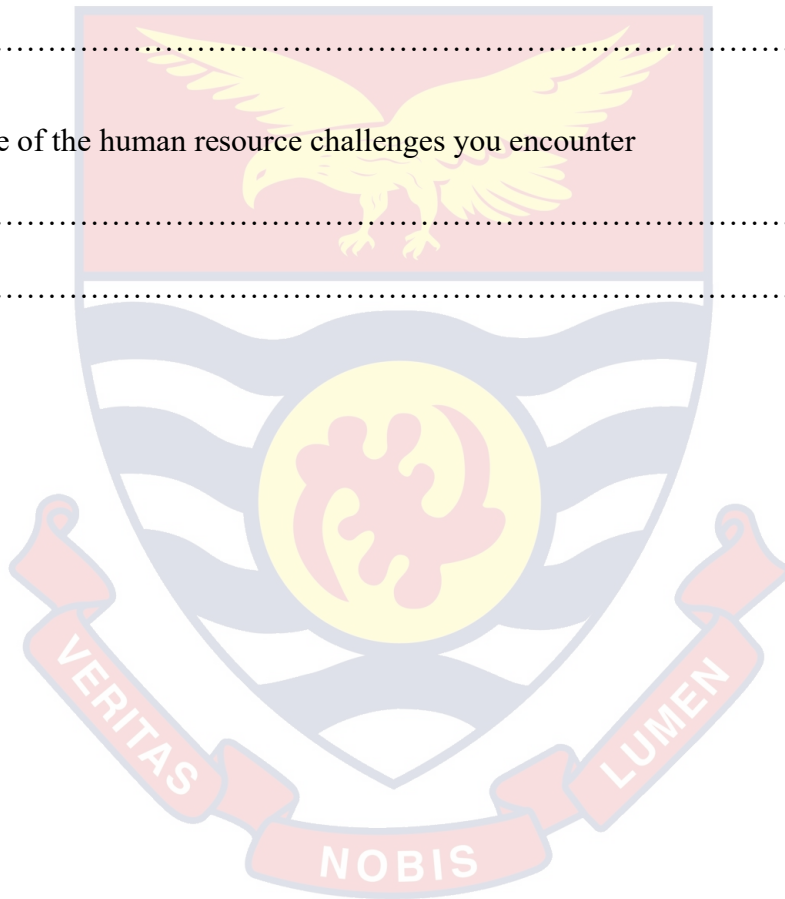
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30. What are some of the logistical challenges encountered with regards to waste management?

.....  
.....

31. What are some of the human resource challenges you encounter

.....  
.....



**APPENDIX “B”  
PRESBYTERIAN UNIVERSITY COLLEGE**

**INTERVIEW GUIDE FOR CLIENTS, MARKET WOMEN, JUNKIES. ETC)**

I am Charles Okoe Bosomprah, a student of the Presbyterian University College of Ghana conducting a research. The purpose of this study is to explore the waste management systems available within the Central Business District of Accra.

This questionnaire is to find out about their operations and management of waste and find out why people dump waste elsewhere on the streets, by the medium of the streets, and in the drains. The questionnaire is also to find out waste disposal and collection systems and challenges in the Central Business District. The outcome of the study will help implement existing policies on waste management and also create new ones.

I would be glad if you can respond to these questions by sparring some few minutes of your time. Any information given will be treated as confidential and used solely for the intended purpose.

**Demographic Data**

1. **Sex:** (a) Male (b) Female
2. **Occupation** .....
3. **Religion**  
(a) Christian (b) Moslem (c) Traditionalist (d) None
4. **Marital status**  
(a) Married (b) Single (c) Divorced

**5. Educational background**

(a) JSS (b) Secondary School/SSS (c) Polytechnic (d) University

**6. Number of children**

(a) 1 – 2 (b) 3 – 4 (c) 5 – 6 (d) 7 and above

**7. Length of stay in business**

(a) 1 – 5 years (b) 6 – 10 years (c) 11 – 15 years (d) 16 years and above

**Waste Management Authority**

**8.** Which waste management company is directly involved in waste management in the central business district

(a) AMA (b) Trash Masters (c) Zoom Lion (e) None of this

**9.** What kind of services does the waste management company render to you in the CBD?

(a)Waste collection (b) Janitorial (c) Waste Collection & Janitorial (e) None of this

**10 .** On what basis is refuse collected by the waste contractor

(a)Daily basis (b) Fortnightly (c) weekly basis (d) monthly basis (e) None of this

**11.** Who are those who dump refuse in front of your shops or by the road side?

(a)Waste Contractor (b) AMA (c) Zoom Lion (d) Kaya Bola / Junkies (e) None

**12.**What kind of checks have you as people in the CBD put in place to make sure people do not dump in front of your shop.

- (a) Inform AMA Task force (b) Arrest, Send them to AMA (c) Ask them to take it away
- (d) None of this

13. Which of the waste management vehicle do you see collect refuse from this area to the final disposal ground?

- (a) Compactor (b) Articulator truck (c) Tricycle (d) Ten wheeler truck (e) None of this

### Waste Management Component

14. What are the composition of refuse or waste in the Central Business District of Accra?

- (a) Organic waste /Plastic (b) Card board /Plastic (c) Organic/Plastic /Card board (d) None

15. What forms of waste segregation do you employ in the Central Business District of Accra?

- (a) 2 way (Organic and Plastic Waste bin) (b) 3 way (Organic, Plastic and Paper waste bin) (c) None

16. Where do you keep your refuse before collection to the final disposal sites?

- (a) In a 240 lit container (b) In a 120 lit container (c) In a Card board container (d) None of this

17. What other information on waste management in the CBD can you share with me that I have not asked you?

### Waste Collection

18. Who sweeps or does the Janitorial work before collection of the waste in the CBD?

- (a) Sweeper of Waste contractor (b) Kaya bola (c) Junkies (d) Hire Somebody (e) None

19. Who picks your refuse for you to the disposal site?

- (a) Sweeper of Waste contractor (b) Kaya Boiler (c) Junkies (d) Hire Somebody (e) None

20. Who registered you for collection of Refuse/ waste in this area.

(a) Meskworld (b) Trash Master (c) AMA (d) Kaya Bola (e) None of this

21. What can you say about refuse disposal and collection points in the Central Business District?

(a) Refuse container needed in area (b) Collection point is too far (c) None

22. Who contracted those who dump refuse by the road side within the CBD

(a) AMA (b) Zoom Lion (c) Trash Masters (d) Shop Owner/Market women (e) None

23. How much money is collected from you for refuse collection

(a) 1-5 Cedis (b) 6-10 Cedis (c) Something small (d) Carry for food (e) None

24. Who have been arresting people for dumping refuse elsewhere within the CBD

(a) AMA Task Force (b) AMA Night patrol team (c) Police Patrol Team (d) None

25. At what time does the refuse truck come to pick the refuse within the CBD

(a) 2.30 am (b) 10.00 pm (c) 6.00 pm (when the sweeper start work) (d) None

### **Refuse Collection – Kaya bola /Junkies**

26. Who has contracted you to collect waste within the CBD?

(a) AMA (b) Meskworld (c) Zoom Lion (d) Market women/Shop Owners (d) None

27. How much money do you collect from your clients?

(a) 1-5 Cedis (b) 6-10 Cedis (c) Something small (d) Carry for food (e) None

28. Who arrested you for dumping refuse elsewhere within the CBD?

(a) AMA Task Force (b) AMA Night patrol team (c) Police Patrol Team (d) None

29. Why do you do this work



.....  
.....  
30. Where are you supposed to send the refuse you pick from the traders and shop owners?

(a) Compactor (b) Articulator truck (c) Tricycle (d) Ten wheeler truck (e) None of this

31. At what time does the refuse truck come to pick the refuse within the CBD?

(a) 2.30 am (b) 10.00 pm (c) 6.00 pm (when the sweeper start work) (d) None

**Challenges Faced by Kaya bola/Junkies**

32. What are some the challenges you encounter in doing this work?

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33. What are some of the logistics one has to get before doing this work?

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