

GHANA INSTITUTE OF JOURNALISM

**ASSESSMENT OF WASTE MANAGEMENT IN THE OKAIKOI NORTH
MUNICIPALITY**

BY

ABUSAH HANNAH YAA

MADC20131

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES
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AWARD OF MASTER OF ART DEGREE IN DEVELOPMENT COMMUNICATION**

DECEMBER, 2021

CANDIDATE'S DECLARATION

I, Hannah Yaa Abusah, declare that this thesis is my own work and has not been presented in part or whole for the award of any degree elsewhere. All quotations and references contained in this thesis have been duly acknowledged.

SIGNATURE:

A handwritten signature in blue ink, appearing to read 'Hannah', with a stylized flourish extending to the right.

DATE: 2nd February, 2022

SUPERVISOR'S DECLARATION

I hereby certify that the preparation and presentation of this work was supervised in accordance with the guidelines of supervision laid down by the Ghana Institute of Journalism.

NAME OF SUPERVISOR: BISMARK NANTOMAH, PhD

SIGNATURE:

A handwritten signature in blue ink, appearing to be 'B. Nantomah', enclosed within a light gray rectangular box.

DATE: 7th February, 2022

DEDICATION

I dedicate this work to my wonderful parents, Mr. and Mrs. Abusah whose love, care and support has brought me this far. I cannot thank you enough for all the sacrifices you have made for me and all you continuously do for me. Your prayers for me has always been to attain the highest level of education and I know this is a dream come through. I really appreciate your support. I hope and pray that God grants you both long lives to enjoy the fruits of your labor. I love you both dearly.

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LIST OF ABRIVIATIONS

MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
MLGRD	Ministry of Local Government and Rural Development
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
IWM	Integrated Waste Management
USEPA	United States Environmental Protection Agency
EPA	Environmental Protection Agency
AMA	Accra Metropolitan Assembly
WMD	Waste Management Department
EHSD	Environment, Health and Sanitation Department
MEST	Ministry of Health Science and Technology
DSSAP	District Level Environmental Sanitation Strategies and Action Plans
ONMA	Okaikoi North Municipal Assembly
GSS	Ghana Statistical Service
SPSS	Statistical Package for Social Scientists

ABSTRACT

Sanitation is an important foundation for health, economic development and well-being hence waste management. The perception of household waste as unwanted material with no intrinsic value has dominated attitudes towards its management. Solid waste management in Ghana has become a major challenge to MMDAs due to urbanization and increasing population densities. Municipal Assemblies find it difficult to deal with the large quantities of waste generated, resulting in people resorting to indiscriminate dumping as the only means to managing their domestic solid waste. The objective of the study was to assess the management of waste in the Okaikoi municipality. The study employed a descriptive survey design and used questionnaires for data collection. The sample size for the study was 303. The sampling method used was simple random sampling method. Data was analyzed using SPSS version 23. The findings showed different categories of wastes including organic such as food waste, plastic, textiles, metal, glass and other form of waste. It was revealed that organic such as food waste was the dominant type of waste generated within the municipality. The study concludes that majority of people living in the municipal have various forms of waste containers. The study recommends that waste should be managed on a community to community basis. The leadership of each community must map out how its waste is collected, stored, processed, and disposed of timely in a hygienic manner. This could be done by separating waste at the source so that contamination is prevented so that the work of community based volunteers and waste management agencies are facilitated.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Many developing countries are still struggling with waste collection and management (Wilson, 2007) China currently produces the largest quantity of municipal solid waste (MSW) in the world at 190, 000, 000 metric tons, (Momoh & Oladebeye, 2010). Projections indicate that by 2030 the rate of waste generation will be 480,000,000 metric tons per year (World Bank, 2005). Waste is any material which comes from domestic, commercial, and industrial sources arising from human activities which has no value to people who possess it and is discarded as useless (Adewumi & Ajibade, 2015).

According to Medina (2000), waste are materials generated from the result of human daily activities resulting from areas such as households, public places and city streets, shops, offices and hospitals. In addition, waste is any material that arises from human and animal activities that are normally discarded as useless or unwanted. It consists of non-hazardous industrial, commercial and domestic waste such as: household organic trash, street sweepings, institutional garbage and, construction wastes (Boadi & Kuitunen, 2004). Waste is more easily recognized than defined. Something can become waste when it is no longer useful to the owner or it is used and fails to fulfil its intended purpose. There are basically two types of waste namely liquid and solid waste (Malav, et al., 2020). Between 0.7 and 1.8 g per capita of waste is produced every day in developed countries' urban areas and approximately 0.4 to 0.9 kg is produced in the cities of developing countries (Shafiul & Mansoor, 2003)

According to Ahmad, Sanusi, Ahamad, and Yusoff (2013), within the Africa continent, Nigeria and Ghana are not an exception to the countries which generates a

greater part of African's waste. Municipal solid waste in developing countries is composed of wastes from household refuse, institutional wastes, commercial wastes, streets sweepings and also remains from various construction works (Shafiul & Mansoor, 2003). Waste management refers to source separation, storage, collection, transportation and final disposal of waste in an environmentally sustainable manner (Adewumi & Ajibade, 2015). According to Quartey, Tosefa, Danquah, and Obrsalova (2015), based on an estimated population of 22 million and an average daily waste generation per capita of 0.45 kg, Ghana generates annually about 3.0 million tons of solid waste. Municipal waste is defined to include refuse from households, non-hazardous solid waste from industrial, commercial and institutional establishments (including hospitals), market waste, yard waste and street sweepings. Municipal solid waste management (MSWM) encompasses the functions of collection, transfer, treatment, recycling, resource recovery and disposal of municipal solid waste

The first goal of municipal waste management is to protect the health of the population, particularly that of low-income groups. Other goals include promotion of environmental quality and sustainability, support of economic productivity and employment generation (Kodwo, Kwasi, Kádár, Fei-Baffoe, & Mensah, 2015). According to Al-Salem and Baeyens (2009), waste collection schemes of cities in the developing world generally serve only a limited part of the urban population. The people remaining without waste collection services are usually the low-income population living in peril-urban areas. Also Boadi and Kuitunen (2004), pointed out some of the problems affecting waste management in Ghana, these include: weak institutional capacity and lack of resources; both human and capital.

Furthermore, Ministry of Local Government and Rural Development [MLGRD] (Ministry of Local Government and Rural Development, 2009) summarizes the

challenges of waste management in Ghana as follows: poor planning for waste management programs; inadequate equipment and operational funds to support waste management activities; inadequate sites and facilities for waste management operations; inadequate skills and capacity of waste management staff; and negative attitudes of the general public towards the environment in general. The health implications of poor waste management can be very damaging to the people exposed to these unsanitary conditions. Diseases such as cholera, typhoid, dysentery and malaria are all related to the practice of poor waste management. This can result in the loss of human resources needed in the development of the country (Anomanyo, 2004).

1.2 Statement of the Problem

According to the United Nations Environment Programme (UNEP, 2010) the total amount of municipal solid waste (MSW) generated globally reached 2.02 billion tones, representing a 7 percent annual increase since 2003. It is further estimated that between 2007 and 2011, global generation of municipal waste rose by 37.3 per cent, equivalent to roughly 8 percent increase per year (UNEP, 2010) Reports from the Ghana Statistical Service (2019) and Salam (2010), indicate that a significant proportion (about 30%) of the population in Ghana does not have access to solid waste services. Asase, et al. (2009), defines solid waste as neither wastewater discharges nor atmospheric emissions, arising from domestic, commercial, industrial, and institutional activities in an urban area. Events of the 20th and early into the 21st century indicate that waste in whatever form or classification- solid, liquid or toxic have become a major consequence of modernization and economic development (Kodwo, Kwasi, Kádár, Fei-Baffoe, & Mensah, 2015).

The associated problems in waste management are basically inadequate institutional facilities to deal with the problem arising out of shortage of expertise, financial resources, legal and administrative enforcement of environmental regulations,

many of which do not conform to the need of the time (Chandak, 2010). Coupled with this is the lack of public awareness and environmental ethics that results in uncontrolled solid waste disposal (Chandak, 2010). According to Puopiel (2010), solid waste management in Ghana has become a major challenge to MMDAs due to urbanization and increasing population densities. Municipal Assemblies find it difficult to deal with the large quantities of waste generated, resulting in people resorting to indiscriminate dumping as the only means to managing their domestic solid waste (UNEP, 2010). This leads to littering and heaping of waste. Puopiel (2010), reported that poor waste management has resulted in littering, heaping of waste and overflowing of skips with waste most especially in the low class residential and peril-urban areas.

Despite the fact that developing countries do spend about 20 to 40 percent of metropolitan revenues on waste management, they are unable to keep pace with the scope of the problem (Babayemi & Dauda, 2009). Solid waste was identified as the second most important problem after water quality (Asase, et al., 2009). The problems of waste management in cities have become burdensome despite efforts being made by city authorities and governments (Ogwuche & Yusufu, 2011). Longe, Longe, & Ukpebor (2009), reported that based on an estimated population of 22 million and an average daily waste generation per capita of 0.45 kg, Ghana generates annually about 3.0 million tons of solid waste. Solid waste collection schemes of cities in the developing world generally serve only a limited part of the urban population. The people remaining without waste collection services are usually the low-income population living in peri-urban areas (Akinbile, Erazua, Babalola, & Ajibade, 2016). A significant proportion (about 30%) of the population in Ghana does not have access to solid waste services (Ghana Statistical Service, 2019). Waste management in Ghana has become a major challenge to

metropolitan, municipal and district assemblies (MMDA) due to urbanization and increasing the issue of waste management.

Densities, Municipal Assemblies find it difficult to deal with the large quantities of solid waste generated. Resulting in people resorting to indiscriminate dumping as the only means to managing their domestic solid waste, this leads to littering and heaping of waste (Babayemi & Dauda, 2009). According to Mathur (2018), indiscriminate disposal of waste in surface drains and streams creates unsanitary and unsightly environment. In most cities of developing countries, waste management is inadequate: a significant portion of the population does not have access to a waste collection service and only a fraction of the generated waste is actually collected (Kodwo, Kwasi, Kádár, Fei-Baffoe, & Mensah, 2015). The Okaikoi North Municipality is one of the developing cosmopolitans in Ghana. It is surrounded by cluster of commerce businesses and market-links and in recent times, waste generation, collection, and disposal has become an emerging challenge. Poor waste management could lead to extra cost spent in treating avoidable diseases.

1.3 General Objective

The main objective of this study is to assess the management of waste in the Okaikoi municipality.

1.4 Specific Objectives

The specific objectives are to:

1. Assess how households dispose domestic waste.
2. Assess the types of waste generated in the municipality.
3. Examine how the Municipal Assembly manages waste.

1.5 Research Questions

1. How do households dispose domestic waste?
2. What types of waste are generated in the municipality?
3. How do the Municipal Assembly manages waste?

1.6 Significance of the study

This research will provide some information that the households, municipal assembly and other stake holders need in other to inform their decisions on waste management. Also, recommendations from this research work would lay the foundation for future studies on waste management.

1.7 Scope and Limitations of the Study

This research is limited to the assessment of waste management in the Okaikoi municipality.

1.8 Organization of the Research

This study contains five chapters. Chapter one discusses the background of the study, statement of the problem, objectives, research questions, significance of the study, scope and limitations of the study and organization of the study. The Chapter two reviews the relevant literature of the study. Chapter three focuses on the methods employed for the study. In this chapter, it describes the study approach, study design, study area, population of the study and sampling size, sampling technique, data collection tools, data collection process, ethical issues and data analysis. Chapter four focuses on the findings and presentation of discussions; whilst Chapter five presents the summary of the study, summary of key findings, conclusions, recommendations and suggestions for further studies based on findings of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter examines the literature about waste management. Issues on waste management have been critically reviewed focusing on the how households dispose domestic waste, how waste are generated and various strategies and laws associated with managing waste in Ghana.

2.1 Households disposal of domestic waste

Household is defined as a social unit, characterised by the sharing of the same dwelling house, with incomes that are pooled together for common use (Ellis, 2012). For the purpose of this study, a household is defined as a social unit, comprised of people living in the same house, with a head, and pooling their incomes together for the management of their dwelling unit. This income is pooled together for food, shelter and other social needs, and for the general management of the household, including domestic waste management (Ogwuche & Yusufu, 2011).

Domestic waste generally refers to all unwanted and economically unusable materials or liquid that result from human activities, discarded purposefully or accidentally into the environment (Jones, 2005). Domestic waste includes ordinary refuse, garbage, swill, rubbish and all forms of refuse from household activities, including human excreta. Generally domestic waste are classified into two thus solid and liquid waste

Generally, solid waste is classified into organic and inorganic and it includes wastes from households/residential waste, non-hazardous wastes from commercial and institutional establishments and non-processed industrial wastes (Tchobanoglous, 2009).

The 2009 Ghana Environmental Sanitation Policy and the Urban Development Series-Knowledge Papers define solid wastes to comprise all solid waste materials generated by residential units (households), institutions (including hospitals and clinics), commercial and industrial establishments, and discharged from such premises for collection; all litter and clandestine piles of such wastes; street sweepings, drain cleanings, construction wastes, dead animals among others. Examples of solid wastes are food scraps, bottles, plastics, cans, tins, appliances (white goods), broken glass and glass wares, paper, and metallic waste among others. In Ghana, household solid waste disposal have evolved over the years in response to population growth, attitudes, policies and urbanisation (Ministry of Local Government and Rural Development, 2009)

Globally, liquid waste disposal and management is undoubtedly a growing major public health concern of which Ghana is no exception. According to the Environmental Protection Agency (EPA), liquid waste is defined as any waste material that passes the definition of a ‘‘liquid’’. Unlike the solid wastes, liquid wastes cannot be easily picked up and removed from an environment. Considering the myriad liquid wastes generation in Ghana over the years particularly in the urban areas, its improper disposal and management, especially human excreta, poses a threat to public health and the environment. Generally, liquid waste includes sewage as well as wastewater from industrial processes such as food and agricultural processing and manufacturing and it includes waste from households, wastes from commercial and institutional establishment and industry. In Ghana, liquid wastes include human excreta, kitchen wastes and bathwater, among others. (Ministry of Local Government and Rural Development, 2009)

In Ghana, household’s disposal of domestic waste is mostly done at public dumps and public containers and it has contributed to 47% and 19% respectively. Significant proportions of 22% households have their waste collected and 15% burn their waste.

Regionally, most households dispose their waste at public dumps and it is done either in containers or in open space. Greater Accra which is the capital of Ghana 63.7% of households has their solid waste collected from their homes. Out of this significant proportion of 15.7% households in Greater Accra dump their waste in containers (Ghana Statistical Service, 2019). Again in 2019 a report by Ghana Living Standards Survey (GLSS) indicates that public dump is the commonest refuse disposal in Ghana, with about 48 percent of households disposing of their refuse at public dump, while about 20 percent and 11 percent of households resort to burning and indiscriminately dumping of refuse respectively. Only 21 percent of households have their refuse properly collected. In Ghana public dumping of refuse is more predominant among the rural (53 percent) than urban (44 percent) households (Ghana Statistical Service, 2019)

In Okaikoi North Municipality the common form of household's waste disposal in the municipality is reported to be public containers. That is significant number of households waste are collected which represent 52.87%. Public dumping accounted for 29.94% about 7.26% of the households' burn their waste, while others without a specified method contributed to 9.93% (Ghana Statistical Service, 2019).

Yoda, Chirawurah, and Adongo (2014), observed that solid waste generated and disposed in Ghana in the 1920s were less complex and toxic than today. It has been well noted that poor waste management and disposal, particularly in Ghana have led to the high incidences of waste-related diseases/illnesses such as cholera, malaria, typhoid fever, intestinal worms, skin diseases among others particularly in urban areas (Yoda, Chirawurah, & Adongo, 2014)

Further, Ghana Health Service Report (2010) showed that six (6) of the top ten (10) diseases in Ghana are caused by and link to poor handling of waste, and for that matter improper solid and liquid waste disposal and management. The report also stated

that malaria, diarrhoea and typhoid fever jointly make up about 70 percent-85 percent of out-patient cases at health facilities across the country. (Ghana Health Service , 2010).

2.2 Household Solid Waste Generated

Waste management has over some time now been a challenge not only in Ghana, but globally (Amoah & Kosoe, 2014). There are however disparities in generation so far as rural and urban areas are concerned. It is generally perceived to be an urban issue due to the population and purchasing power of urban dwellers. The situation has worsened mostly due to technological advancement, making the speed at which waste is generated even faster than urbanization (Modak, 2010). The need for capacities such as procurement, contract management, professional and labour management has also made waste management an intensive service (Hoorweg & Bhada-Tata, 2012). An estimated 11.2 billion tonnes of waste are collected worldwide on a yearly basis and decay of the organic proportion of solid waste is contributing to about 5% of global Greenhouse Gas (GHG) emissions (Modak, 2010).

In sub-Saharan Africa, approximately 62 million tonnes of waste is generated in a year. Per capital waste generation is generally low in this region, but spans a wide range, from 0.09 to 3.0 kg per person per day, with an average of 0.65 kg/capita/day (Hoorweg & Bhada-Tata, 2012). The complete functional elements of waste management which are generation, onsite storage, collection, transfer and transport, disposal, processing and recovery of solid waste, have not been met in Ghana, as focus is only on collection and disposal (Amoah & Kosoe, 2014). This has made waste management in Ghana a poor practice. The total solid waste generated in Ghana as at 2016, is approximately 8.5 million tonnes, whereas that of the Greater Accra Region is generating the highest of 3.7 million tonnes, with Okaikoi North Municipal being approximately, 119,716 tones (Ghana Statistical Service, 2019).

2.3 Waste Management in Ghana

In Ghana, policies on household waste disposal generally fall under community waste disposal policies and laws, which are largely delegated to and carried out by the Metropolitan, Municipal and District Assemblies (MMDAs), in consultation with the Regional Coordinating Councils, as established in the Local Government Act, 1993 (Act 462). This law officially empowers the health and waste management departments of the local government authorities (MMDAs) to design, implement, enforce, and maintain proper waste management and disposal practices in Ghana. Generally, policies to manage disposal of household wastes (solid and liquid) primarily falls under the broader umbrella of sanitation programmes. The National Environmental Sanitation Policy (ESP), which was formulated in 1999 and revised in 2009 serves as the only comprehensive waste management policy in Ghana (Ministry of Local Government and Rural Development, 2009)

2.3.1. The National Environmental Sanitation Policy

The national environmental sanitation policy was the first comprehensive policy geared at sanitation and waste management in Ghana. It was initiated by the Government of Ghana in 1999, through the Ministry of Local Government and Rural Development (MLGRD), in consultation with the Ministry of Health, Ministry of Works and Housing, Ministry of Education, Ministry of Environment, Science and Technology, the Community Water and Sanitation Agency (CWSA), MMDAs, the private sector and other stakeholders, with funding from WHO, WEDC International Conference, Loughborough University (LU/WEDC, 2005). The policy was revised in 2009, in line with the Millennium Development Goals and approved by the Government of Ghana on advice of Cabinet Sub-committees on Health, Local Government, Environment, and Industry. The policy (revised) assessed the causes of poor waste disposal and sanitation,

designs the basic principles and objectives for ensuring proper waste collection, disposal, and management, as well as the institutional responsibilities for realising these objectives (Ministry of Local Government and Rural Development, 2009)

The policy covers all aspects of household, community and environmental waste collection and disposal, with strong focus on promoting and ensuring proper liquid (excreta) and solid waste disposal in Ghana. This was in line with Ghana's decentralisation programme at the time and the need to put in place policies that ensured local participation and promotion of waste management and good health. In sum, this policy vested MMDAs, through their waste management departments (WMDs) and environmental health and sanitation departments (EHSDs) with the responsibility of ensuring proper household waste management and disposal practices, environmental monitoring and all planning required for efficient and healthy population. However, the responsibility for developing the needed environmental, community and domestic infrastructure such as toilets rested with communities and households. Key priority areas of the policy are:

- ✓ Collaboration between the Ministry of Local Government & Rural Development, Ministry of Environment, Science & Technology, and the Ministry of Finance to design modalities on drawing funds from the consolidated fund to implement sanitation programmes and projects.
- ✓ Broadening the “polluter-pays” principle and applying suitable regulations to generate revenue for funding sanitation projects.
- ✓ Development of appropriate communication strategy by the Ministry of Information, Ministry of Local Government & Rural Development, and other key partners, for disseminating the policy.

- ✓ Prepare a National Environmental Sanitation Strategy and Action Plan (NESSAP) and Strategic Environmental Sanitation Investment Plan (SESIP) to ensure the policy's effective implementation.
- ✓ Building and enhancing the capacity of frontline environmental health and sanitation workforce while designating environmental sanitation as an essential service towards achieving middle income status. (Ministry of Local Government and Rural Development, 2009)

2.3.2 Waste Collection Agencies in Ghana

Waste from our homes is generally collected by our local authorities through regular waste collection, or by special collections for recycling. Within hot climates such as that of Ghana, the waste should be collected at least twice a week to control fly breeding, and the harbouring of other pests in the community (Anomanyo, 2004). The Municipal and District Assemblies are the key institutions responsible for the management of sanitation and waste at the local and community level. They are however, supported in this task by a number of other institutions and organizations. For example, the Environmental Protection Agency (EPA) gives technical support to the District assemblies by setting environmental standards and guidelines on waste management; administration of Environmental Assessment Regulations; undertaking environmental education and awareness programmes; and monitoring environmental quality. Ghana Environmental Assessment Regulations, 1999 (LI 1652) make provisions for existing undertakings, which are required to submit Environmental Management Plans (Demanya, 2006).

The United Nations Environmental Programme (UNEP, 2010) defines economic instruments as tools or actions which have the purpose of affecting the behaviour of economic agents by changing their financial incentives. For instance, the Accra

Metropolitan Assembly's main economic tool is privatization. Advocates of privatization believe that profit competitive systems increase efficiency and better calibrate supply and demand. Opening the waste management market to competition can stimulate development of better pollution control technology and expertise. Before 1995, solid waste management was run purely as a government monopoly. Economic instruments can be grouped into two categories:

- i. revenue- raising instruments (licenses, user charges), and
- ii. Non-revenue instruments (performance-based management contracting, clean neighbourhood competitions, privatization). The problem of waste collection is structurally dissimilar from the problem of waste disposal.

Surveys performed by the United Nations Environment Program (UNEP, 2010) in both high and low income households indicate that post-privatization frequency of collection and cleanliness of service has improved. Privatization has permitted waste collection services to be allocated to the parties who value them the most. Opponents to Accra's privatization program acknowledge that the living standard in higher social economic classes has increased, but they argue that the benefits of privatization are not experienced equally by residents of Accra. Poorer socioeconomic classes have only received marginal benefits. However the government was failing to adequately address the sanitary needs of its citizens. Failures in public servicing opened the domain to various modes of public-private cooperation. Critiques of privatization point out that waste collection relies on the government management of infrastructure ensuring streets are paved and accessible and enforcement of zoning laws against squatters.

2.3.3 Process of Waste Management

The Committee for Economic Development (CED, 2010) defined waste management as the collection, transport and disposal of solid waste or other wastes,

including after-care of disposal sites. Management of waste reduces or eliminates adverse impacts on the environment and human health and supports economic development and improved quality of life. A number of processes are involved in effectively managing waste for a municipality these are;

- ✓ Re-use
- ✓ Recycling
- ✓ Compositing
- ✓ Landfilling
- ✓ Incineration
- ✓ Bioremediation
- ✓ Waste-to-energy

Re-use involves the recovery of items by using them again or technique involving the re-utilisation of material in its end-use form without the necessity of further value addition or reprocessing. It helps save energy and water, reduces pollution and lessens society's consumption of natural resources when compared with single-use products and materials. Households reuse plastic bags, containers, and newspaper and glass bottles among others. Reuse not only saves money but also is a source of revenue for those who implement it.

Recycling involves collecting the wastes from different places and segregating them according to the nature of products and used for recycling process. Recycling simply consists of finding new ways of using previously discarded materials. Solid waste recycling is therefore recognized as a tenable solution for cleaning up the cluttered environment. The materials that can be recycled include plastics, wood, metals, glass, textiles, paper, cardboard, rubber, ceramics and leather. Organic solid waste can also be recycled into fertilizer for agricultural purposes. Recycling reduces the amount of

household solid waste to be collected, transported and disposed of promoting cleaner environment and economic competitiveness (Al-Salem & Baeyens, 2009).

Composting is where Organic wastes are separated from the wastes and allow to decompose by microbes for a long period of time in a pit. Then this becomes nutrient rich compost and used as a manure for the plants. Soil fertility is enriched by these manures. Composting through biological technique progresses the fertility of the soil. Vermicomposting method reduces environmental impact and enhances the nutrient content of the soil (Chandak, 2010). Vermicomposting is the effective process for sustainable organic agriculture and for also to maintain a balanced ecosystem (Kaur, 2020).

Landfilling also known as a tip, dump, rubbish dump, garbage dump, or dumping ground, is a site for the disposal of waste materials. This involves dumping the wastes in the soil is called as Landfilling. Proper procedure are adopted for landfilling such as lining the base with protective layer, selecting low groundwater level area, etc. Skilled manpower is needed for this process. In China, construction of horizontal wells reduces leachate level in landfills containing municipal solid waste (Zhang, Zhang, & Liu, 2020). Physical, chemical and biological processes-based model controls the Hg emission from landfills (Tao, Deng, Li, & Chai, 2020)

Incineration involves burning the wastes at high temperature is called as Incineration. To avoid air pollution (caused during burning of wastes), proper filters are used. For handling sludge, direct incineration method without anaerobic digestion was found to be more preferred sustainable approach (Amoah & Kosoe, 2014). Degradation technologies such as plasma, mechanochemistry, hydrothermal, photocatalytic and biodegradation had proved that they have good purification effect and are considered as the best resource of MSWI fly ash (Zhang, Zhang, & Liu, 2020).

Bioremediation involves the process of using microbes and bacteria for removing the impurities, pollutants and poisons from soil, water and other environments is called as bioremediation. Energy power generation plants emit radioactive wastes which is the major threat to the human population. To reduce these wastes, bioremediation strategy is used. Bioremediation technologies rectifies the heavy metal pollution problem and helps to regain the natural condition of soil (Saini & Dhania, 2020). Bioremediation is an eco-friendly, inexpensive, and effective technology which is encouraged for the safe discharge of water from industrial activities (Coelho, 2020).

Waste-to-energy is the process of creating energy in the form of electricity or heat from the primary treatment of waste. In China, anaerobic digestion technology is used for energy recovery and also has been identified as an effective approach to minimize the degree of harm of GHG emissions which are related to FW treatment (Tao, Deng, Li, & Chai, 2020). Waste-to-energy technologies such as pyrolysis, gasification, incineration, and bio-methanation can convert MSW, as an appropriate source of renewable energy, into useful energy (electricity and heat) in safe and eco-friendly ways (Malav, et al., 2020)

2.3.5 Problems of Waste Management in Ghana

Mensah (2005), stated in his factsheet that the key problems with waste disposal in Ghana principally relate to:

- ✓ Problems with indiscriminate dumping;
- ✓ Increasing difficulties with acquiring suitable disposal sites;
- ✓ Difficulties with conveyance of solid waste by road due to worsening traffic problems and the lack of alternative transport options; and
- ✓ The weak demand for composting as an option for waste treatment and disposal.

Boadi and Kuitunen (2004), pointed out that in Ghana some of the problems affecting waste management. These include weak institutional capacity and lack of

resources; both human and capital. They also stated that home collection of waste is limited to high and some middle income areas while the poor are left to contend with the problem on their own. This leads to indiscriminate disposal of waste in surface drains, canals and streams, creating unsanitary and unsightly environments in many parts of the city. Furthermore, the Ministry of Local Government and Rural Development (Ministry of Local Government and Rural Development, 2009) summarizes the challenges of solid waste management in Ghana as follows

- ✓ Poor planning for waste management programmes
- ✓ Inadequate equipment and operational funds to support waste management activities
- ✓ Inadequate sites and facilities for waste management operations.
- ✓ Inadequate skills and capacity of waste management staff and
- ✓ Negative attitudes of the general public towards the environment in general.

It can therefore be said that the main challenges facing solid waste management in developing countries and for that matter Ghana are inadequate funds to support waste management, inadequate equipment to support waste storage, collection and disposal, low collection coverage, irregular collection services, crude open dumping and burning without air and water pollution control.

CAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter outlines the methods used in the study and provides information on data gathering and data analysis. The chapter discussed the study approach, research design, population, sample and sampling procedure, instruments, data collection procedure and data analysis procedure.

3.2 Study Approach

Research is the systematic investigation and study of materials and sources to establish facts and reach new conclusions, so it shapes people's understanding of the world around them (Creswell, 2014). Through research findings, researchers are able to explain individuals' behaviors, including how people think and act in certain ways (Creswell, 2014). Research methods include the qualitative, quantitative and mixed methods. This study employed quantitative research. Quantitative research is the process of gathering observable data to answer a research question using statistical, computational, or mathematical techniques (Creswell, 2011). It is often seen as more accurate or valuable than qualitative research, which focuses on gathering non-numerical data. Quantitative research requires careful experimental design and the ability for anyone to replicate both the test and the results (Dearing, 2009)

3.3 Research Design

According to Alhojailan (2012), research design is the blue print within which the research project is undertaken and focuses on vital facts about people and the opinions, attitudes, motivations and behavior and simply provides an understanding of a phenomenon. Research design is a framework for conducting research. It specifies

detailed procedures for obtaining information needed to solve a research problem (Bekerman, 2020). The study used a descriptive survey design. According to Conner and Armitage (1998), descriptive survey aims at observing, describing and documenting aspects of a situation as it naturally occurs rather than explaining them. Descriptive survey research uses surveys to gather data about varying subjects. This data aims to know the extent to which different conditions can be obtained among these subjects.

3.4 Study Area

The Okaikwei North Municipal Assembly (ONMA) is one of the thirty- eight newly created District/Municipal Assemblies inaugurated on Thursday, 15th March, 2018 across the country under the President of Ghana, His Excellency Nana Addo Dankwa Akuffo - Addo. The capital of the Municipal Assembly is Abeka. It is currently among one of the Two Hundred and Fifty-Four (254) Metropolitan, Municipal and District Assemblies (MMDAs) in Ghana and one of the Twenty-Six (26) MMDAs in the Greater Accra Region. It was carved from the Accra Metropolitan Assembly on 14th November, 2017. The ONMA was established under the Local Governance Act, 2016, (Act 936) with Legislative Instrument (L.I) 2307. It has eleven (11) electoral areas and includes Apenkwa, Wuoyeman, Blema Gor, Olengele Koona, Gbemomo, Anorhuma, Akweteman, Nii Boiman, Achimota, Abofu and Anumle.

According to the 2010 Population and Housing Census Okaikwei North Municipal Assembly had 228,271 representing 5.7% of Greater Accra Region's population (4,010,054). The females (117,590) formed 51.5% of the population as against (110,681) 48.5% males denoting more females than males in the Municipality. The total population of Okaikwei North Municipality Assembly is 291,420 at a growth rate of 3.1 according to the 2018 population projections by the ONMA Statistics Unit. The females (150,120) make up 51.5% of the population while the males (141,300) make up 48.5%

of the population. There is an average of 3.7 persons per household in the Municipality. The average number of households per house is 11.1. The household normally consists of a head, with or without spouse, children, in-laws, parents, grandchildren, and other relatives. A total of 96.1% of the total population of Okaikwei North Municipal live in households. Majority of the houses in the Municipality are owned by other private individuals (42.1%) followed by houses owned by a household member (36.5%). Household headship is generally dominated by males with the exception of compound houses (66.8%). Compound houses were the majority (67.7%) followed by those living in separate houses (9.7%). Tent and Huts/ buildings (different compound) were the least (0.2%).

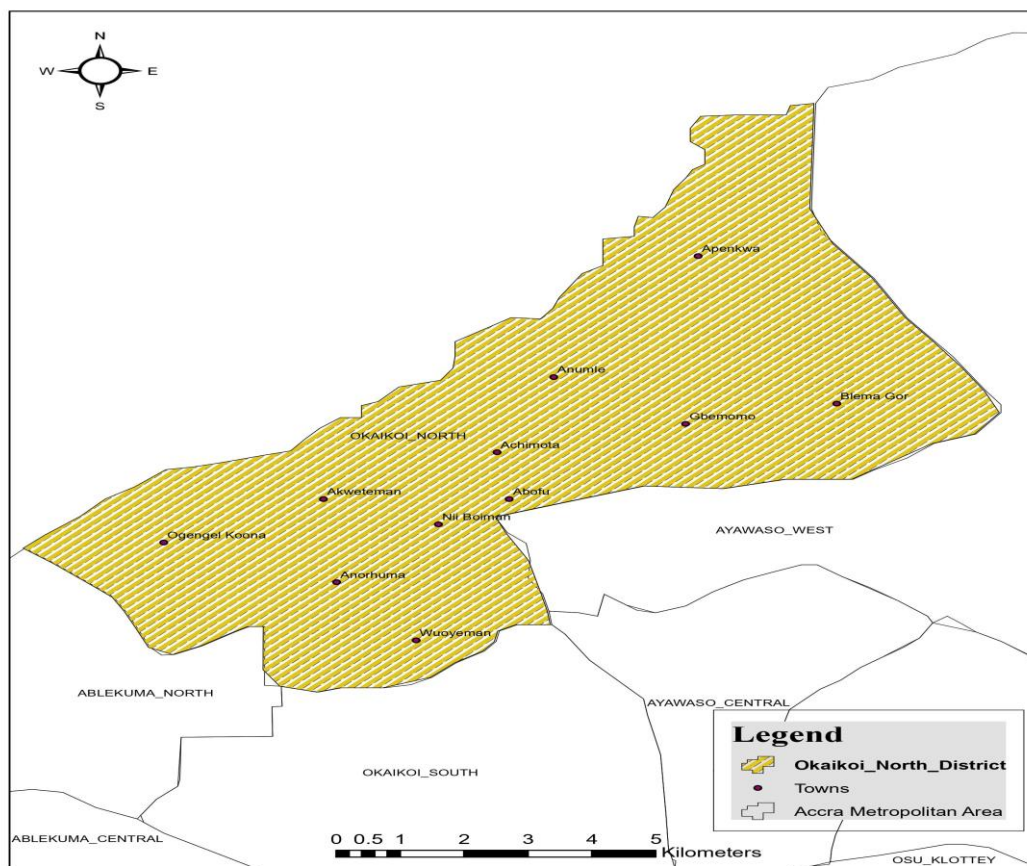


Figure 1: Map of the Okaikoi North Municipality.

Source: Centre for Remote Sensing and Geographic Information Studies (CERGIS) of the Department of Geography and Resource Department, University of Ghana (2021).

3.5 Population of the Study

A population is defined as a set of potential measurements or values, including not only cases actually observed but those that are potentially observable (Halai, 2006). The Okaikwei North Municipal Assembly has a population of 291,420 (ONMA Statistics Unit, 2019).

3.6 Sample Size

A sample is a small part of something intended as representative of the whole (Lally, Barr, McCarthy, & Cook, 2007). In practice, the sample size used in a study is determined based on the expense of data collection and the need to have sufficient statistical power (Creswell, 2014). The Land Valuation Department of the Okaikoi North Municipality (2018) end of year assessment report indicates that, the number of households in the municipality amounts to 1257.

In this study, a total of 1257 households was targeted. Therefore, to determine the sample size the Yamane (1967) formula was adopted:

$$n = \frac{N}{1 + Ne^2}$$

In this formula;

“*n*” represents the sample size to be calculated,

“*N*” present the relevant population (number of target respondents) of the community,

“*e*” present (standard error) depends on the required confidence level set by the researcher and

“1” presents a constant figure

The sample size was calculated;

$$n = \frac{N}{1 + Ne^2}$$

N = 1257 (The total households in the municipality)

$e = 0.05$ (95% of confidence level was adopted)

$n=?$

$$n=1257/(1+1257(0.05)^2)$$

$$n=1257/4.14= 303$$

In all, a total number of 303 households was selected for the study. The sample size comprised of women, men district assembly members and waste management members.

3.7 Sampling Technique

According to Conner and Armitage (1998), sampling is the process of selecting units from a population of interest so that by studying the sample, a fair generalization of results can be made based on the population from which they were chosen. A good sampling technique allows the researcher to make efficient contact with social phenomena while wasting as little time as possible. Bekerman (2020), the purpose of sampling is to enhance data collection that we use for research analysis when the population being studied is larger. In statistics, a sampling frame is the source material or device used to obtain observational access to finite population of interest (Halai, 2006).

It must be possible with the aid of a frame to;

- i. Identify and select a sample in a way that respect the a probability sampling design and;
- ii. Establish contract with selected element (by telephone, visit at home, mailed questionnaire, etc)

For this study, the researcher employed direct element sampling technique were the frame directly identifies the individual elements (Households) of the population of interest. The direct element sampling technique allows the researcher to hand pick the

sample based on the characteristics of the population (Pereira, Durão, & Santos, 2019). The researcher visited the Okaikoi North municipality. With the help of Land Valuation Department's District Secretariat the participants within the required category was recruited. The researcher then called members recruited to know if they were interested in participating in the research. A follow up and a time schedule was made to distribute the questionnaires to the participant.

3.8 Data Collection Technique

The study used both primary and secondary sources in data collection. In gathering the primary data for the study, questionnaires were administered to respondents. Questionnaires were used because they are good to measure attitudes and eliciting other content from research participants (Saunders, Lewis, & Thornhill, 2007). Also, questionnaires can also provide information about participant's internal meanings and ways of thinking. The questionnaires included a set of both open-ended and close-ended items and it had Four (4) sections which were linked directly to the research objectives which were raised for the study. Open-ended questions give room for unanticipated but useful data and they are easy to construct as they do not require special skills and competencies. On the other hand, close-ended questions restrict the respondents to the options given. Close-ended questions make the respondent's work easier, there is an assurance of focus and it saves time. The merits of both the open-ended and the close-ended questions justify their combination.

The first section of the questionnaire sought to solicit information on the background of the respondents. The variables covered here include the category of respondents, gender, age, academic/professional qualification, occupation and number of households. These were important since they helped the researcher to determine the level of understanding of the respondents concerning the subject under investigation.

The second section of the questionnaire was to ascertain views on how households dispose domestic waste. The purpose for this section was to determine the various means by which the households within Okaikoi North municipality dispose their domestic waste that were reviewed in the literature. Both open-ended and close-ended questions were used to find how households dispose domestic waste.

The third section of the questionnaire focused on the types of waste generated in the municipality. The reason here was to evaluate the magnitude of waste generated within municipality.

The fourth and final section examined the various methods/strategies the Municipal Assembly adopt in managing waste. The reason here was to evaluate the positive or negative methods/strategies used by the municipal assembly in combating waste within the municipality.

In this data collection technique, the respondents got and filled in a well-structured questionnaire. The questionnaire were personally delivered and later picked from the premises of the respondents. Also, the respondents were free to use their own words to provide the response to the way they deemed fit. The respondent were given time to fill in the questionnaires. The researcher believes that this method gave the respondents enough time to reflect, concentrate and in some instances to consult. However, to the semi-literate respondents, the questions were translated into local languages for clear understanding and correct responses.

3.9 Data Collection Process

First, the research seek permission from the Chiefs, Queen Mothers, Assembly Members and heads of various households. All briefings and discussions on the purpose of the study were explained to the respondents before administrating the questionnaires.

These minimized errors in answering them. Questionnaires were distributed to selected respondents and they were allowed a period of two weeks to complete the questionnaire. The researcher then collected the answered questionnaires for analysis to be done. The researcher used a period of two weeks to collect both primary and secondary data.

3.10 Ethical Considerations

According to Bekerman (2020) the ethical requirements for 'informed consent' in research, require potential respondents to formally provide knowing consent to participate in a research project as an exercise of their choice, free of any element of fraud, deception, duress, or other unfair inducement or manipulation. Standard ethical practices required of any reputable academic research and ethical codes of Ghana Institute of Journalism are highly considered by the study. During the data collection, respondents are made fully aware of the purpose of the study. The respondents' privacy and confidentiality were guaranteed, and the information acquired was not shared with anybody who is not directly involved in the study. The principle of secrecy was guaranteed by keeping the respondents unidentified throughout the study.

3.11 Data Processing and Analysis

Data obtained was analyzed using the Statistical Package for Social Scientists (SPSS) version 23. This statistical tool aids in the use of descriptive and inferential analytic techniques (means and standard deviations). Pearson Product Moment Correlations are used to determine how dependent and independent variables are related. The data is presented in the form of tables, charts, and percentages.

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.0 Introduction

This chapter presents and discusses the findings of the study. The findings and discussions are based on: How households dispose domestic waste; the types of waste generated in the municipality; and how the municipal assembly manages waste

4.1 Demographics of the Participants

Table 1 shows the demographics of the participants. Majority of the participants were females (52%). Most of the participants were between ages 20 – 30 years old (45.2%) while the least were between ages 21 – 50 years old (5.1%). Also, over two-thirds of the participants have had tertiary education (81.1%) while few have had no formal education (2%), 3% had vocational education. Again, most of the participants were Christians (93.3%). In relation to marital status, over-half of the participants were single (58.1%) while very few of them were widowed (1%). Majority of the respondents were employed (64.4%) while 25.8% were unemployed. The household sizes of majority of the participants were between 1 – 10 people (90.3%) while the least household sizes were between 21 -30 people (1.3%).

Table 1 : Demographics of the Participants

VARIABLE	FREQUENCY	(%)
Gender		
Male	142	48.0
Female	154	52.0
Total	298	100

Age (Years)		
20 – 30	134	45.2
31 – 40	131	44.3
41 – 50	15	5.1
50 And Above	16	5.4
Total	296	100
Educational Qualification		
No Formal Education	6	2.0
Primary/JHS	5	1.7
Secondary/SHS	36	12.2
Tertiary	240	81.1
Vocational Education	9	3.0
Total	296	100
Religion		
Christianity	278	93.3
Islam	18	6.1
Traditional	2	0.7
Total	298	100
Marital Status		
Single	173	58.1
Married	116	38.9
Widowed	3	1.0
Separated	6	2.0
Total	298	100

Occupation Status		
Unemployed	77	25.8
Employed	192	64.4
Self-Employed	29	9.7
Total	298	100
Number of Households		
1 – 10	260	90.3
11 – 20	19	6.4
21 – 30	4	1.3
Above 30	6	2.0
Total	289	100
Residential Unit		
Detached house	43	14.43
Semi-detached house	124	41.61
Flat	38	12.75
Compound House	93	31.21
Total	298	100

Source: Field Data, 2021

4.2 How Households Dispose Domestic Waste

Table 2 shows how households dispose of domestic waste. Majority of participants (91.2%) indicated that they have waste containers in their homes while the remaining (8.8%) did not have any waste containers at home. Majority of the participants representing 91.9% indicated that they are required to pay a monthly fee in order for their waste to be collected while participants who indicated that they do not pay any fee or charges when their waste are been collected formed 8.1%.

Table 2 : Assessment of Waste Disposal

Statement	Yes (%)	No (%)
Do you have any waste containers in your home?	91.2	8.8
Are you required to pay a monthly fee for the collection of waste	91.9	8.1

Source: Field Data, 2021

4.3 Type of waste containers for storing waste

Table 3 shows the type of waste containers for storing waste. Majority of participants (76.1%) use plastic bins with a cover for storing their waste. Participants representing 11.1% uses bucket with cover for storing their waste a few participants (6.4%) use plastic bin without a cover, with a least of participants (2.5%) also use a bucket without a cover. The findings also revealed that 3.9% of the participants uses other form of waste containers for storing their waste.

Table 3: Type of waste containers for storing waste

Statement	Used bucket without cover (%)	Used bucket with cover (%)	Plastic bin without cover (%)	Plastic bin with cover (%)	Others (%)
What type of waste containers do you use for storing waste	2.5	11.1	6.4	76.1	3.9

Source: Field Data, 2021

4.4 Frequency of Waste Disposal

The frequency of garbage disposal is seen in Table 4. The majority of participants (31.9%) stated that they dispose of their garbage twice a week, followed by participants (30.5%) who stated that they dispose of their waste on a daily basis. The findings also

indicated that (23.8%) Participants dispose their garbage three times each week few participants (4.0%) dispose of their garbage four times each week, the findings also revealed that (9.7%) of the participant dispose of their waste as and when is needed.

The majority of participants (31.9%) reported that the trash truck takes discarded rubbish for disposal from their waste containers twice weekly, while another 28.5 percent claimed that their waste gets collected whenever the garbage truck comes through. Furthermore, the finding revealed 22.8% of participants said their trash gets collected three times a week, 14.1% said every day, and 2.3% said four times a week.

Table 4: Frequency of Waste Disposal

Statement	Everyday (%)	2 times a week (%)	3 times a week (%)	4 times a week (%)	As and When (%)
How often do you dispose of waste?	30.5	31.9	23.8	4.0	9.7
How often does the garbage truck collect discarded waste for disposal from the waste bins?	14.4	31.9	22.8	2.3	28.5

Source: Field Data, 2021

4.5 Mode of Collection of Waste

Table 5 shows the mode of collecting waste. Majority of the participants (74.2%) indicated that trucks collects their waste. The findings further revealed that (13.1%) of the participants waste are collected by carts, a few (10%) is collected through other modes whiles the least (2.3%) of their waste is collected with wheelbarrows.

Table 5: Mode of Collection of Waste

Statement	Carts (%)	Wheelbarrows (%)	Trucks (%)	Others (%)
What is the mode of collection of waste?	13.1	2.3	74.2	10.4

Source: Field Data, 2021

4.6 Institutions Responsible for Waste Collection in the Municipality

Table 6 shows the various institutions responsible for waste collection in the municipality. Majority of participants (83.3%) stated Zoomlion as the institution responsible for waste collection. However, other institutions responsible are AMA, Asad waste management, JS Waste management, JSO Group, Liberty waste management, Meridian waste management, Zoompac Ghana Ltd and others.

Table 6: Institutions Responsible for Waste Collection in the Municipality

Statement	Frequency	Percentage (%)
AMA	3	1.0
Asadu waste management	2	0.7
JS Waste Management	2	0.7
JSO Group	14	4.7
Liberty waste management	2	0.7
Meridian waste management	2	0.7
Nawabin	3	1.0
STMA	2	0.7
Zoomlion	250	83.3
Zoompac Ghana Ltd	8	2.7
Others	12	3.8

Source: Field Data, 2021

4.7 Types of Waste Generated in the Municipality

Table 7 shows the types of waste generated in the municipality. Majority of the waste generated (60%) in the municipality is organic. This is followed by plastic waste (28%). Glass garbage accounted for (4.8%) of the municipality's waste, while textiles and metal waste accounted for (1%) and (0.7%) of the municipality's waste, respectively. Secondary data on the proportions of household domestic waste generated in the municipality, the findings revealed that estimated proportion of waste generated in the district is approximately 119,716 tones.

Table 7: Wastes generated in the municipality

Statement	Organic (%)	Plastic (%)	Textiles (%)	Metal (%)	Glass (%)	Others (%)
What are some of the waste generated in the municipality?	60	28.6	1.0	0.7	4.8	4.8

Source: Field Data, 2021

4.8 How the Municipal Assembly Manages Waste

Table 8 shows how the municipal assembly manages waste. Majority of participants (59.9%) stated that there is no waste system in the municipality with the remaining over one-third (40.1%) stated that there is a waste management system in their municipality.

Table 8: Waste Management System in the Municipality

Statement	Yes (%)	No (%)
Is there a waste management system in the Municipality?	40.1	59.9

Source: Field Data, 2021

4.9 Methods of Managing Waste

Table 9 shows the methods of managing waste. Majority of participants (44.5%) stated that the method they use in managing waste in their community is recycling, over one-third (32.8%) stated composting is the method used, a few participants (17.4%) used incineration while the least (3.4%) feed the waste to animals.

Table 9: Methods of Managing Waste

Statement	Composting (%)	Recycling (%)	Incineration (%)	Reusing (%)	Feeding to animals (%)
What are the methods of managing waste in your community?	32.8	44.5	17.4	1.9	3.4

Source: Field Data, 2021

4.10 Discussion of Findings

The study findings indicate that the total solid waste generated annually in the study area is approximately 119,716 tones, thus this finding is consistent with the Ghana Statistical Service (2019) work which stated that the total solid waste generated in the Okaikoi North Municipal as at 2016, is approximately 19,716 tones.

The study findings indicate that majority of the respondents in the study areas have containers which they deposit their household domestic waste (91.2%). The findings also indicated that 91.2% of the respondents pay monthly charges for their waste to be collected and disposed in an appropriate site, this was confirmed by a report published by Ghana Statistical Service (2019) that the residents of Okaikoi North Municipal usually have their domestic waste collected and dumped in an appropriate way.

Also, level of education, occupation status, household size, marital status and residential unit are the major influencing factors contributing to the choice of method of household solid waste disposal in the study area. This is similar to Long *et al* (2009) work which stated that education, household size and occupation status of the respondent have a significant relationship with the method of household solid waste disposal. Those who are employed or self-employed are likely to afford waste management services such as zoom lion dustbin while those who are not employed are not likely to afford. Comparatively, those with high education level are more capable to practice good household domestic waste disposal method but those with no or little education tended to have bad attitudes towards household waste disposal.

The findings showed different categories of wastes including organic such as food waste, plastic, textiles, metal, glass and other form of waste. It was observed that organic such as food waste is the dominant type of waste generated in these households and it accounts for 60% of the weight composition in the waste. Plastic waste 28.6% is next to organic waste, textiles, metal, glass waste forms 6.5% of waste generated within the municipality. It is therefore evident that most wastes generated in the study area are biodegradable. This agrees with the findings of Amoah & Kosoe (2014), that most wastes generated in households in growing cities of developing countries are biodegradable wastes thus (food, paper, fabrics etc).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents a summary of the study, summary of main findings, conclusions, and recommendations.

5.1 Summary of the Study

The main objective of this study was to assess the management of waste in the Okaikoi municipality. The specific objectives were to;

1. Assess how households dispose domestic waste.
2. Assess the types of waste generated in the municipality; and
3. Examine how the Municipal Assembly manages waste.

The research design that was used was a descriptive survey design. Purposive sampling technique was used to select 303 respondents for the study. The data was collected from 2nd December to 22nd December 2021. The study instrument was a questionnaire and the data obtained was analyzed using the Statistical Package for Social Scientists (SPSS) version 23. This statistical tool aided in the use of descriptive analytic techniques and were presented in the form of frequencies, mean, standard deviation, percentages and tables.

5.2 Summary of Main Findings

Findings from this study indicated that majority of participants have waste containers in their homes and are required to pay money for the collection of their waste. Also, majority of participants use plastic bins with a cover for storing their waste and again indicated that they dispose of their waste twice a week. Further findings also show that garbage truck collects discarded waste for disposal from their waste bins twice every

week followed by other participants also stating that the truck collects their waste monthly and once every fortnight.

The findings further showed different categories of wastes including organic such as food waste, plastic, textiles, metal, glass and other form of waste. It was revealed that organic such as food waste was the dominant type of waste generated within the municipality.

Lastly, majority of the participants stated that there is no waste system in the municipality. Also, majority stated that the method they use in managing waste in their community is recycling, followed by composting and incineration

5.3 Conclusion

The following conclusions were drawn based on the outcome of the study;

The study concludes that people in the municipality are made to pay monthly fee in order for their domestic waste to be collected. These approach affected the unemployed who unable to regularly pay for these charges thereby forcing them to adopt other means of disposing their waste.

The study concludes that majority of people leaving in the municipal have various forms of waste containers. Which is a positive sign that majority of the households within the municipality are managing their waste by depositing them in a container.

It was concluded that organic such as food waste was the dominant type of waste generated within the municipality.

The study also concludes that garbage truck regularly collects discarded waste for disposal from the waste bins of the various households. Which is a positive sign of managing waste in the municipality.

The study also concludes that the method they use in managing waste in the municipality are recycling, composting and incineration

5.4 Recommendations

The following recommendations are made based on the research findings in the area of waste management in the Okaikoi North Municipal

First, waste should be managed on a community to community basis. The leadership of each community must map out how its waste is collected, stored, processed, and disposed of timely in a hygienic manner. This could be done by separating waste at the source so that contamination is prevented so that the work of community based volunteers and waste management agencies are facilitated.

Secondly, an Integrated Solid Waste Management (ISWM) policy should be adopted by the Municipal Assembly, sanitary health workers and Zoomlion Company who are the main authorities in charge of waste collection and its general management. The ISWM system involves primary collection and recycling at community level while improving the health and environmental conditions of community dwellers. The entire system of waste management needs a total overhauling from collection, storage, recycling to disposal

Third, community members should be encouraged and educated on how to prepare briquettes. It is the combination and blending of every waste material available to come out with a new product. This can be used as fuel for cooking in the various households in the municipality.

Finally, authorities should build more recycling plants so that waste generated within the communities, can serve as a sustainable source of livelihood for thousands of unemployed people and also prevent extra pollution from all the waste generated.

5.5 Suggestions for Further Study

The major recommendation for future research is for a study to be undertaken on a larger-scale that is other municipalities in Ghana as this will give researchers a wider scope on how waste is managed in the country at large.

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APPENDIX
QUESTIONNAIRE

I am a final year student at the Ghana Institute of Journalism offering MA in Development Communication. This questionnaire is intended to solicit information for a dissertation in partial fulfilment of requirements for the award of the MA (Degree) by the University. The topic is on “*Assessment of waste management in the Okaikoi North Municipality.*” The data obtained will be used only for academic purposes and your confidentiality is assured. Please read through carefully and provide the relevant responses. Thank you for your cooperation.

SECTION A

PERSONAL DATA

Mark the appropriate responses from the following questions.

1. Gender Male () Female ()

2. Age

 - a. 20-30 years ()
 - b. 31-40 years ()
 - c. 41-50 years ()
 - d. Above 50 years ()

3. What is your educational background?

 - a. Primary /JHS
 - b. Secondary/SHS
 - c. Tertiary
 - d. No formal education
 - e. Other(s) Specify.....

4. What is your religion?

- a. Christianity ()
- b. Islam ()
- c. Traditional ()
- d. Other(s) specify ().....

5. What is your occupation?

- a. Unemployed
- b. Teacher
- c. Petty trader
- d. Others specify

6. What is your marital status?

- a. Never married
- b. Married
- c. Divorced
- d. Widowed
- e. Separated
- f. Other (s), specify

7. Number of members in your household.....

SECTION B: Assessment of how households dispose domestic waste.

Mark the appropriate responses in the following questions.

8. Do you have any waste containers in your home/ premises?

- a. Yes
- b. No (if No skip to question 10)

9. What type of waste containers do you use for storing waste?

- a. Used basket/bucket without cover
- b. Used basket/bucket with cover
- c. Plastic bin without cover
- d. Plastic bin with cover other

10. How often do you dispose of waste?

- a. Everyday
- b. 2 Times a week
- c. 3 Times a week
- d. 4 Times a week
- e. Other (s), specify

11. How frequent does the garbage truck collect discarded waste for disposal from the waste bins?

- a. Everyday
- b. 2 Times a week
- c. 3 Times a week
- d. 4 Times a week
- e. Others

12 What is the mode of collection of waste?

- a. Carts
- b. Wheelbarrows
- c. Trucks
- d. Others Specify.....

13. Are you required to pay money for the collection of waste?

.....
.....

14. Which institutions are responsible for waste collection in the municipality?

.....
.....

SECTION C: Assessment of the types of waste generated in the municipality.

Mark the appropriate responses in the questions below.

16. What are some of the waste generated in the Municipality?

Note: You can choose responses as many as they apply to you.

- a. Organic (left-over foods, rotten foodstuffs, peels from yam, and fruits)
- b. Plastic
- c. Textiles
- d. Metal
- e. Glass
- f. Others (Specify).....

17. Between organic (food, fruits, peels from yam etc.) and inorganic (plastic, metal, glass etc.) waste, which contributes more waste in the community?
- a. Organic
 - b. In-organic

SECTION D: Examination of how the Municipal Assembly manages waste.

Answer by ticking the appropriate responses in the following questions.

18. Is there a waste management system in the municipality?

- a. Yes
- b. No

If yes, describe it.....

If no why?

19. How will you assess the services related to waste management in the municipality?

- a) Excellent
- b) Very good
- c) Good
- d) fair
- e) Very bad
- f) Bad

20. Is there adequate equipment available for managing waste in the municipality?

- a. Yes

Name some.....

- b. No (if No, go to Question 21)

21. What are the methods of managing waste in your community?

- a. Composting
- b. Recycling
- c. Incineration
- d. Re-using
- e. Feeding to animals

23. Suggest strategies to be used in overcoming challenges of waste management in the municipality.....