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COMMUNITY PRACTICES AND PERCEPTION OF DOMESTIC WASTE MANAGEMENT IN MADINA OF THE GA EAST MUNICIPALITY

BY

RAMATTA MASSA YOADA

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DECLARATION

I, Ramatta Massa Yoada, declare that except for the other people investigations which have been duly acknowledged, this work is the result of my own original research and that this dissertation, either in whole or in part has not been presented elsewhere for another degree.

Author:

_____

Ramatta Massa Yoada

MPH Resident University of Ghana,

School of Public Health, University of Ghana

Academic Supervisor

_____

Dr. Philip Baba Adongo

School of Public Health, University of Ghana

DEDICATION

This work is dedicated to my parents, Mr. Abdoulaye Yoada and Mother Musu Washington and also to my dear husband Mr. Samuel G. Kogar for their endless prayers and emotional support throughout my stay. May our Good God richly bless them.

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ABSTRACT

African cities reveal aspects of the waste-management challenges such as uncontrolled garbage, roadsides littered with refuse and streams blocked with junk. Solid wastes pose significant threats to public health and the environment if they are not stored, collected and disposed of properly. The perception of solid waste as an unwanted material with no intrinsic value has dominated attitudes towards disposal.

The study investigated the waste disposal practices and perceptions of people towards domestic waste management in Madina of the Ga East municipality. The study used the mix method approached that is, quantitative and qualitative methods. A total of 364 respondents were interviewed in the quantitative survey whereas six key informants were interview for the qualitative data. Quantitative data was analyzed using SPSS version 16. Descriptive statistics were run to generate frequencies, percentages and cross tabulations. For qualitative data, recorded interviews were transcribed, coded and analyzed manually.

Results from the study revealed from the multiple responses, food debris constituted 93.1%, whereas plastic waste constituted 77.8% as the highest solid waste generated by households. Most of these waste products were lumped together in uncovered plastic bin. It was deduced that 61% of the households disposed their waste at the community bins or the waste is pick at their homes by private contractors. The remaining 39% disposed their waste in gutters, streets, hole and in nearby bushes. Of those who are using the paid service of private contractors, 62.9% are not satisfied with the services because of cost and irregular collection. About 83% of the respondents are aware that improper waste

management contributes to disease causation; furthermore they see the management of solid waste as the responsibility of children.

With proper public education, provision of more communal dust bins couple with motivated staff who will monitor the functions of private contractors' in the municipality could help in protecting the public from diseases and minimized financial contained on the authorities.

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LIST OF ABBREVIATIONS

EPA – Environmental Protection Agency

MSW- Municipal Solid Waste

UN – United Nation

MLGRD – Ministry of Local Government and Rural Development

MMDAs – Municipal and District Assemblies

HHW – Household waste

WMDs - Waste Management Departments

LI – Legislative Instrument

HIPC – Highly indebted poor Country

MHMT- Municipal health management team

CHAG – Christian health association of Ghana

DEFINITIONS OF TERMS

Waste (also referred to as rubbish, trash, refuse, garbage, or junk) are materials that are not prime products (that is products produced for the market) for which the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose.

Domestic Solid Waste: are waste materials discarded for disposal by households, including single and multifamily residences, to include heterogeneous mixture of paper, plastic, cloth, metal, glass, organic matter, etc. generated from households.

Waste management is the hygienic handling of waste right from the point of generation through storage, collection and transport, treatment and final disposal such that the waste does not pose danger to public health and the environment.

Adequate sanitation refers to provision and on-going operation and maintenance of systems of disposal of household refuse, waste water and human excreta in a manner that is acceptable and affordable to the users.

Putrescribe are waste materials that are reliable to decay.

Hazardous waste is waste that poses substantial or potential threats to public health or the environment. These wastes may be found in different physical states such as gaseous, liquids, or solids.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Globally, millions of tons of municipal solid waste are generated every day. Urban waste management is drawing increasing attention, as citizens observe that too much garbage is lying uncollected in the streets, causing inconvenience and environmental pollution, and being a risk for public health (Nyang'echi, 1992). According to the 2003 report of the United Nations Centre for Human Settlements (UN-Habitat), quite a large number of urban dwellers live in 'life-threatening' conditions of poverty and environmental degradation, and the number is supposed to swell significantly by 2025.

Managing Urban waste is a big challenge globally; it has become a major challenge for developing countries like Ghana. It results in diverse problems and demands a complex approach to resolving problems created by improper waste disposal. According to the 2009 World Bank report, Municipal Solid Waste (MSW) includes refuse from institutions, market waste, yard waste and street sweepings. In other words, the term "municipal waste" applies to the waste generated by households and also wastes of similar character derived from shops, offices and other commercial units.

The waste generated in the 1920's was less voluminous and less complex as compared to modern day Ghana and was composed largely of leaves, paper and wood products ; less of plastic, and hazardous chemicals (Ghana Statistical Service,2003). In the colonial

days, the population of the Gold Coast was below six million and public dustbins were provided, with periodic refuse collection by labourers using mule carts. In 1924 a small fleet of Lorries replaced the mules. Collections were not always frequent enough to keep the dustbins from overflowing and they often attracted goats and chickens. Children delegated to carry out the family trash sometimes failed to get it into the bins; more child-accessible model was introduced in 1938. Solid wastes were used as fill for quarries and borrow pits. A municipal incinerator was installed in 1920; by 1938 it was handling almost 37,000 tons of refused annually (Patterson, 1979).

Internal storage facilities were traditional baskets; papers, metals and wooden boxes in homes; and communal storage sites were at designated places at the outskirts of the towns. These sites were under the control of community members with occasional checks by the environmental officers of the colonial administration. Most households treated their waste by burning and composting into manure for their farms (Patterson, 1979).

The phenomenon of waste minimization, reuse and recycle was the practice on a small scale. Peels from cassava, plantain, rice or maize were used to feed domestic animals. Colonial and traditional rules governing waste handling and disposal were rigidly enforced and obeyed. Public education on the importance of good personal hygiene and sanitation was embarked upon regularly through school health, community durbars and work place practices. Public and residential places were sprayed regularly to get rid of disease causing germs, vectors and other harmful agents from the environment (Environmental sanitation policy guidelines of Ghana, MLGRD, 1999).

The environmental health officers popularly called “samasama”(a corruption of the word “to summon”) or “tangasi”(corrupted for the word for Town council) were people trained in the various schools of hygiene (korle-Bu or Kintampo) to undertake routine house to house sanitary inspections aimed at ensuring compliance to standardised personal responsibilities and be deterrent to others. Stray animals were impounded and owners duly fined. Housing systems were relatively simple, land was in abundance and communal spirit was at its peak. The cost of waste management was within the reach of the local authorities (Environmental sanitation policy guidelines of Ghana, MLGRD, 1999). As in many developing countries, waste management in Ghana is a complex issue that has been a major feature on the priority list of successive governments, local authorities, and international donors in recent years. Waste management is a growing problem in Ghana, despite large investments that have gone into meeting the challenges of effective waste management in urban Ghana there is little evidence that such efforts are having their expected impact (Mensah, 2005).

It is in this light that this study aim to investigate community practices and perceptions about solid waste management and to suggest ways to combat the challenge.

1.2 Statement of the Problem

Disposal of solid and liquid waste is a major challenge confronting the Ga-East municipality. The municipality is also bedevilled with the issue of waste being disposed into water bodies and water ways which causes choking and development of stench in the area leaving residents worried (Mensah, 2005). The waste is generated as consequences

of household activities such as the cleaning, cooking, repairing empty containers, packaging, huge use of plastic carry bags (Achankeng, 2003). Huge garbage is lying down uncollected beside the roads, streets dustbins and on the ground which is causing threat to the environment as well as endangering public health.

This research therefore intends to study the waste management practices and perceptions of individuals in the Madina community with the aim of identifying the problems and recommending ways to better manage and dispose solid waste or control it. The rate of waste generation and management in the municipality is a matter of concern to the Ga East assembly. The existing systems cannot cope with the ever-increasing volume of solid waste being generated in the municipality. This becomes more challenging with every passing day especially when very little is known about the perceptions and the practices of domestic waste management, it is important to understand the social aspects of the waste disposal and its effects to help enhance effective educational and behavioural interventions.

1.3 Justification

To investigate the waste disposal practices and perceptions of people towards domestic waste management in Madina of the Ga East municipality was the general objective of the study. The study is meaningful because it shows the means of domestic waste management in the Municipality.

This study can thus add to information available on the perception and practices of domestic waste management to develop more practical strategies to solve the current challenge the municipal faces. Importantly, the study informed stake holders involved in

the management of waste at the study area, and their contribution to solid waste management in the area.

1.4 Research Questions

- What are the various types of solid waste generated by households and how do they disposed of their waste?
- How do the people within the community perceive solid waste and its management?
- What are the social and cultural factors associated with solid waste disposal that affect that community?

1.5General Objective

The aim of the study was to investigate the waste disposal practices and perceptions of people towards domestic waste management in Madina of the Ga East municipality.

1.5.1 Specific Objectives

The specific objectives of the study were to:

- To determine the types of solid waste generated by the household and how they are disposed off in the Madina municipality.

- To assess the perceptions and socio-cultural factors affecting disposal of solid waste in Madina municipality.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The challenges of Global Waste Management

The challenges presented by waste generated, globally, has been in the form of labour force for waste management, collection, transportation and disposal of waste, and lack of final disposal sites for municipal solid waste. Although governments and local authorities apply all the means at their disposal, the piles of wastes only seem to grow from day to day. It is estimated that an individual generates approximately 450grams of waste every day (Nyang'echi, 1992).

India cities are faced with a serious solid waste problem (Admed and Jamwal, 2000), similar to many cities in the developing world. The municipal authorities responsible for the waste collection, transport and disposal rarely have appropriate strategies, methods for mobilization of financial resources or the necessary infrastructure for organized waste management (Diaz et al., 1996). This leads to poor collection coverage especially in poor or marginal areas of the cities and to uncontrolled disposal of waste. Up to 50% of the waste generated daily remains uncollected in the cities; the remaining waste is collected irregularly, dumped in an uncontrolled manner or burnt on vacant plots in or on the outskirts of cities (Anon, 1996).

The problem of solid-, liquid-, and toxic-waste management in Africa, has come with urbanization in the developing world (Onibokun and Kumuyi, 2004). An important

feature of the urbanization of the developing world is the rapid growth of cities and metropolitan areas. Rapid urbanization is taking place especially in developing countries. Since 1985, 41 percent of the world population lived in urban areas, and by 2015, the proportion is projected to rise to 60 percent. Of the urban population, 68 per cent will be living in the cities of low-income and lower middle-income countries. This compares to trends in the developed countries. For example, between 1990-1995 Asia's urban populations, for example, has grown at an average rate of 3.2 per cent, with just 0.8 per cent growth in rural areas. A study done in the Netherlands found out that the most important social and management problems faced by community-based solid waste management projects appear to be motivational issues and cooperation with municipalities. Motivational issues refer to the motivation of participating households and their servants, of operators and managers of solid waste services. They have crucial roles in the functioning of the service (Anschütz, 1996).

Urban population in developing countries has outstripped the capacity of city administrators to provide and expand infrastructure, deliver services and/or devise and maintain regulatory mechanisms (Bhuiyan, 2008). A visit to any African city today will reveal aspects of the waste-management problem such as heaps of uncontrolled garbage, roadsides littered with refuse, streams blocked with junk, disposal sites constituting a health hazard to residential areas, and inappropriately disposed toxic wastes. It is estimated that 30-60 percent of all the urban solid waste in developing countries is uncollected and less than 50 percent of the population is served. In some cases, as much as 80 percent of the collection and transport equipment is out of service, in need of repair

or maintenance. In most developing countries, open dumping with open burning is the norm (World Bank Report, 2009).

The high rate of urbanization in African countries implies a rapid accumulation of refuse. Social and economic changes that most African countries have witnessed since the 1960s have also contributed to increases in waste generated per capital (Onibokun and Kumuyi, 2004). In most African countries, local government operations have been unreliable and inefficient because of bad management, low productivity and a wasteful use of manpower, ineffective supervision of the workforce, and lengthy or ineffective disciplinary procedures. Local political factors often lead to the employment of excessive numbers of personnel and the appointment of untrained executives. In most African countries municipal staff are replaced with each political change brought by an election (as often as every four years), and in such cases there is little chance for public sector staff to develop their expertise in waste management, and little motivation for them to develop their skills(Coad and Batz,2005).

If a local administration is unable to provide an efficient service directly, using its own workforce, it may also have difficulty in preparing the necessary arrangements for engaging a contractor, and in overseeing the contractor effectively. If public sector operators have not been able to achieve satisfactory standards themselves, they may be unable to monitor the private sector in a satisfactory way. If local government has been unable to ensure adequate funding of the recurrent expenses of public sector operations, it

may also have difficulties in making regular payments to a contractor (Coad and Batz, 2005).

As a result of these Municipal solid waste management constitutes one of the most crucial health and environmental problems facing managers of African cities (Achankeng, 2003). Recent events in major urban centres in Africa have shown that the problem of waste management has become a monster that has aborted most efforts made by city authorities, state and federal governments, and professionals alike. Asomani-Boateng and Haight (1999), quoting Adedibu and Okekunle (1989) noted that many African cities streets are partially or wholly blocked by solid waste. Similarly open spaces, marketplaces are littered with solid waste. In most cases drains are clogged or totally blocked and many compounds are hemmed in by solid waste.

2.2 Challenges of waste management in Ghana

In Ghana, problems are encountered at all levels of waste management namely, collection, transportation and disposal. Generally existing public facilities including sanitary facilities are inadequate to serve the user population, and the sheer volume of municipal solid waste generated in the country's urban centres is overwhelming. While existing solid waste disposal facilities are inadequate to deal with the quality and quantity of waste generated, sophisticated systems besides, maintenance requirements are high (Sam, 2002). In several cases waste collection vehicles, compactors and other heavy equipment required for effective waste management are too few and so existing resources have to be stretched to cover wider catchment areas than is desirable. The main sources of funding for environmental sanitation services are from the national budgetary

allocation and bi-lateral and multilateral donor support from World Bank. Funds are also made available to the Districts from the HIPC inflows while MMDAs are expected to use a sizeable portion of their locally generated revenue to handle their own municipal Solid Wastes.

In addition, existing final disposal sites for municipal solid waste are not engineered and may be described as crude dumpsites. There is no waste separation at the sources of generation, and hazardous and clinical wastes are often handled together with municipal solid waste. The situation creates a suitable environment for breeding of disease vectors such as mosquitoes and cockroaches and the proliferation of rodents such as rats and mice (Sam, 2002).

Another problem in managing waste disposal in Ghana is the issue of weak law enforcement. Every year governments come up with beautiful bye-laws for waste disposal. Unfortunately these laws only work on the paper but are poorly enforced on the ground. In Ghana today, people still dispose of their waste across streets in the glare of the day and go scot free without punishments from authorities.

However, regulatory authority is vested in the Environmental Protection Agency (EPA) under the auspices of the Ministry of Environment and Science. The policy framework guiding the management of hazardous, solid and radioactive waste includes the Local Government Act (1994), Act 462, the Environmental Protection Agency Act (1994), Act 490, the Pesticides Control and Management Act (1996), Act 528, the Environmental Assessment Regulations 1999, (LI 1652) the Environmental Sanitation Policy of Ghana (1999), the Guidelines for the Development and Management of Landfills in Ghana, and

the Guidelines for Bio-medical Waste (2000). All these Acts and Regulations emanate from the National Environmental Action Plan. These legislations and policies are designed to provide the basis for protecting public health and the environment, employing mainly locally available and adequate techniques, knowledge and recourses to provide efficient services to the general public(Ghana Sanitation country profile,2004).

The problem of waste management in Ghana places a heavy financial burden on the government. This places a far greater burden on the assembly than it can manage since budgetary allocations for operation and maintenance are always inadequate (Mensah, 2005). Due to this inadequate financing, there is a low technical know-how in terms of waste disposal facilities and equipment. Most assemblies either use limited number of disposal trucks or are insufficiently equipped with personnel to handle the increasing rate of disposal resulting from the rapid urbanization in the cities (Jackson, 2009).

Generally, existing facilities including sanitary facilities are inadequate to serve the user population, and the sheer volume of municipal solid waste generated in the country's urban centres is overwhelming. It is estimated that throughout the country only about 10% of solid wastes generated are properly managed. The overwhelming majority of landfills in Ghana are open dumps even though these are strongly discouraged in the national sanitation policy (Mensah, 2005). In an era of shrinking municipal budgets and a restriction of the scope of municipal government jurisdiction, the problem is likely to intensify unless alternate approaches can be developed (Schienbeig et al., 1997). Yet, Ghana generates about 3.3 million tons of solid waste annually with Accra alone contributing 1,500 tons of waste daily (Ghana Landfill Guidelines, 2002).

2.3 Components of Solid Waste

Solid waste can be put under two main categories; solid municipal and domestic waste. Municipal solid waste has an organic part, recyclable and consists of putrescible materials. In India, It has been discovered that the organic fraction of the waste makes up 40-85% of the municipal solid waste (National solid Waste of India, 2003). Between 30-40% of municipal solid waste is made up of food and garden waste, whilst 20-30% is made up of paper and cardboard waste. In 2004, the city of Mexico Demarcation reported that 460,000 tons/year of waste were generated. From this, 50% came from households, 46% was plastic, 16% paper, 9% cardboard and 7% metal sheets (Muñoz-Cadena et al., 2006). On the average every Swiss produces 373 kilograms of solid waste per year, A Norwegian produces 251 kilograms of solid waste per year; a Dane generates 380 Kilograms of waste per year and a German produces 480 kilograms per year. Most of these wastes are burnt in the district heating power plant therefore less waste goes to the Landfills (Eurostat, 2003).

Moreover, about 50-70% of municipal solid waste is biodegradable (Smith et al., 2001). Paper, leaves, and grass clippings can be decomposed in this process in backyard compost bins, and the end result can be used in gardens and flower beds (Miller Jr., 1990). Also, approximately 31% of municipal solid waste is putrescribe and 29% is paper waste (Smith et al., 2001). Putrescible waste is the fermentable fraction of bio-degradable waste. Bio-degradable wastes are waste capable of undergoing aerobic and anaerobic decomposition example food, paper waste, and garden waste. They are also described as the bio-degradable fraction of municipal solid waste.

It has been observed elsewhere that packaging materials are becoming an increasingly important component of municipal waste in developed countries. Recent estimates suggest that packaging materials account for about 30 per cent of municipal waste in the USA (US EPA, 1990).

Domestic waste contains a variety of items, but it appears, plastic, paper and metals form a significant part of it, everywhere. A survey done in Santiago de Cuba, 2006 on the topic formulating waste management strategies based on waste management practices of households reveal that the households generate the following wastes, which include plastic 11%, metal 10%, glass 22%, paper 11%, organics 34%, aluminium 7% and residual 5% (Mosler et al., 2006).

This finding relates to that of the research project carried out during 2002 and 2003 by the Surrey County Council and the Borough and District Councils. Researches of the project examined about 580,000 tonnes of household waste, collected from the door step of people, street sweepings and people visiting recycling centres. Finding from the study shows that household waste consist paper, plastic, metals, glass and other food waste (Source: http://www.surreywaste.info/communities/facts/composition).

2.3.1 Factors Influencing Waste Generation

A study conducted in Pennsylvania, United States of America to determine attitudes and household characteristics influencing solid waste generation. The objective of this study was to determine the household characteristics that are related to the amount of solid waste generated and to suggest policies to reduce the pressures on increasingly scarce

landfill space. In their result they found out that families that consumed significant amounts of soft drinks in nonreturnable glass bottles may have more packaging waste than those who use other soft drink containers or who drink none at all, also self-sufficiency and energy–conscious behavioural scales also affected the subgroup with female householders having an educational level of high school graduation or less and concluded that the importance of income , family size and weekly food expenditures helps in the generation of waste. The study recommended that changing certain behaviour and altitudes would reduce the weight of garbage. It is noted that the amount of municipal waste generated depends on the income and lifestyle of the population (Lardinois et al., 1993).

The rapid rate of uncontrolled and unplanned urbanization in the developing nations of Africa has brought the challenge of waste management (Onibokun and Kumuyi, 2004). Increasing rural-urban migration into the Ga East municipality has thus compounded the problem of waste management as citizens lack the responsibility of adequate waste disposal and rather rely on government to dispose waste. This in part may be due to poor attitude of the people and lack of concern about the environment and public health (Ga East profile, 2008).

2.3.2 Collection and disposal of waste

In Europe and a few other places around the world, a few communities use a proprietary collection system known as Envac, which conveys refuse via underground conduits using a vacuum system. Other vacuum-based solutions include the single-line and ring-line systems. In Canadian urban centres curb side collection is the most common method of

disposal, whereby the city collects waste and/or recyclables and/or organics on a scheduled basis. In rural areas people often dispose of their waste by hauling it to a transfer station. Waste collected is then transported to a regional landfill. In contrast, in Taipei, the city government charges its households and industries for the volume of rubbish they produce. Waste will only be collected by the Taipei council if waste is disposed in government issued rubbish bags. This policy has successfully reduced the amount of waste the city produces and increased the recycling rate (Sorting through garbage for gold, 2009). Thus, waste collection methods vary widely between different countries and regions.

In developing countries, household solid waste management (HSWM) in large cities is often mismanaged, resulting in severe consequences for the urban population such as high rates of morbidity, aesthetic degradation, economic losses produced by flood propagation or simply by the absence of waste valorisation through recycling and recovery. For instance, in Dakar, a Senegal–Canadian consortium is in charge of collecting and transporting wastes and in managing the landfill. A Swiss company even proposed to invest up to 5 billion of FCFA per year (€7,622,450) for the development of a ‘‘composting’’ industry. However, the problem is still growing, with the following trends: The rapid population growth produces more and more urban wastes that are not sorted and are considered as valueless by inhabitants, except for some small parts purchased by itinerant informal merchants. This growth is mainly a result of the migration of starving people from rural areas to the peri-urban areas, where they build slums with the hope of improving their situation. Solid wastes are not always collected

and sometimes are thrown anywhere by the population, resulting in dumps that are causes of epidemics and floods (Kapepula et al.,2007).

In Ghana, the main types of collection service in the city of Accra are the communal collection and house to house. House to house collection is a method of collecting domestic solid waste in which the individual place the bins full of waste outside their homes at the curb side or road side on the specific days for collection. The residents served by the house to house waste collection use standards bins (120 or 240liters). The house to house service is rendered to residents in the high and middle income area. On the other hand, communal collection is a system for solid waste collection in which individuals bring their solid waste directly to the communal skip containers and secondary collection points from where the waste is collected and transported to the disposal sites by the companies. The communal solid waste services are provided under service contract arrangements between the municipal authority and the private companies. The municipal authorities pay the companies for the services delivered but only 11 percent of the 1.4 million people in Accra benefit from home collection of their solid waste (Orudo-Kwarteng and Dijk, 2008).

Solid waste is collected and disposed of at designated landfill and waste dump sites by public and private waste management firms. There is substantial injection of public resources into the District Assemblies in the form of waste collection vehicles and tools, and funds. There are funds from the central Government in the form of District Assemblies Common Fund for sanitation purposes. Recently, the issue of landfill site

location has been a matter of strenuous negotiations with rising population pressure continuing to impact on waste generation and management (Sam, 2002).

2.4 Waste Disposal Practices

A study conducted in Ijebu Ode, Southwest Nigeria, using a total of 300 respondents, shows that methods of disposing domestic Waste were: by burning (65, 21.7%) burying (22, 7.3%), depositing into gutter (45, 15%), putting on road side for waste managers (150, 50%); dumping on undeveloped land (18, 6%)((Banjo et al., 2009). The findings of the study undertaken in Southwest Nigeria compares with one recently carried out in Ghana. In Ghana, a research carried out at Kodiabe, which involved direct observations made at disposal place of 267 respondents, from five divisions, focused on the way refuse materials were disposed of (Rhule, 2008). The results of the study show that refuse which was gathered to the surface of a floor or ground was immediately collected on a flat object and kept in a range or refuse containers including baskets and basins prior to disposal at a place, burned, disposed of on undeveloped land areas along the road and buried to form mounds on the landscape. His research also informs that refuse was disposed off either south west or south east of their house compound.

Rhule (2008) observed that refuse was transported from households for disposal at a distance not less than 11m and more than 200 meters, at Kodiabe. Although his research, conducted in 2008, focused on archaeological implications of refuse disposal, his findings suggest health implications of waste disposal habits. In 2009, there was a high incidence of sanitation related illness such as cholera, intestinal worms and typhoid which were among the top ten diseases that was recorded, this raises an alarm of public health concern and was acted upon speedily (Ga East profile, 2008). Moreover, pieces of

information picked up by the Accra File reveals that some individuals in the capital city engage in the bad habit of diverting their liquid waste into the main drains/gutters. This causes serious stench in some parts of the capital (Norley, 2009).

2.4.1 Health Implications of Waste Disposal

Drains in the cities are choked with rubbish. This is a result of lack of public containers for the disposal of rubbish. Poor collection of waste services and public insensitivity has lead to the creation of dumps. These refuse dumps are surrounded by flies and animals, unpleasant smell, hazardous smoke of burning rubbish thus these have health implications(http://switchaccra.files.wordpress.com/2008/02/state-of-sanitation-in-accra.doc).

Infectious diseases of poor sanitation and poverty are the most common diseases affecting the residents of Accra. Accra is facing the problems of improper waste disposal, contamination of water and streams, and many service management deficiencies (http://www.accessmylibrary.com/coms2/summary_0286-11603527_ITM).

A study, which sought to identify the problems of solid waste management in Nima, shows that most of the refuse is kept close to kitchens and rooms, which may cause diseases like cholera and typhoid fever. It was noted that a greater part of wastes generated in Nima seem not to undergo any treatment before their final disposal. They are left in piles for weeks to create unsanitary scenes that smell bad and, worst of all, create diseases (http://www.kon.org/urc/v6/george.html).

Malaria is a disease spread by the female Anopheles mosquito which could be prevented by making the environment unsuitable for the breeding of these mosquitoes. Breeding is suitable in places where water is stagnant, mostly caused by drains choked by the rubbish in our country. The diseases associated with unsanitary living conditions result in the loss of human resources needed in developing the country. The government is forced to increase its spending on health to keep these diseases under control when they could have easily been prevented. This unnecessary increased spending on combating diseases retards national development (Mensah, 2008). Melanie Anton (2008) notes that drinking water is produced and stored in plastic sachets. These plastic sachets can be filled with rainwater, which are ideal breeding grounds for malaria-carrying mosquitoes and other disease-carrying insects (http://www.thestatesmanonline.com/pages/news).

And forty percent of diseases reported at hospitals are those directly or indirectly influenced by dirty environments (Fusein, 2007). Indeed, in a city where the problem of littering and waste disposal is so out of control, it is of no surprise that diseases such as malaria, cholera and typhoid proliferate (http://www.modernghana.com/news).

2.4.2 Perceptions of Domestic Waste Management

A study conducted on inhabitant's perception on domestic waste disposal indicates that wrong attitudes and perceptions of the people towards sanitation issues contributed to waste management problem of Ijebu-ode (Banjo et al., 2009). The findings of the study indicated that respondents with primary and secondary education had little or no knowledge about the harmful effects of waste to the organism and the environment when not properly disposed. It was also found that there was a relationship between the

respondents' level of education and their perceptions about waste management in their surroundings. A higher percentage of those with relatively higher education (Senior School Certificate and tertiary) thought it was appropriate for individual to properly dispose their waste.

Similarly, a study done in Khulna , Bangladesh found out that dwellers think that because they pay taxes, it is the sole responsibility of the city authority to provide them with a nuisance-free habitable city (Amin et al.,2005). Typically, local governments are responsible for the collection and disposal of the wastes generated within their jurisdiction, as well as for the operation and maintenance of their equipment. However, local governments usually lack the authority and resources to provide a satisfactory and economically viable service. Effective and efficient solid waste management depends upon an equitable distribution of responsibilities, authority, and revenue between national government and all local governments (Palczynski, 2002).

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

But there is a growing perception in Ghana that low levels of education on the importance of adequate sanitation account for poor waste management practices in Ghana. Other factors accounting for this situation are Poor attitude and concerns to environmental issues, high levels of poverty and unguided waste disposal practices (Norley, 2009).

Proper waste management is a public good. Improper waste disposal by one individual affects all community members. Every individual, establishment or institution shall be responsible for: Cleansing within and in the immediate environs of the property they occupy, including access ways and the drains and roads abutting the property; Temporary storage of wastes within the property and disposal thereof outside the property, as may be directed by the competent authority; Hygienically disposing of all wastes they generate in public areas by use of an authorised public toilet or sold waste container as appropriate; Participating in all communal environment sanitation exercises organised by the community or its representatives (Environmental sanitation policy guidelines of Ghana, MLGRD, 1999).

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter focus on the methodology of the study. It describes the population and sample, including the sample size and its demographic characteristics. It also describes in detail the instruments used for data collection. It presents the design and procedures used in the study.

3.2 Research Design

The study was a descriptive one and utilized both quantitative and qualitative methods for data collection. The quantitative aspect was carried out among community members while the qualitative aspect was carried out among key informants. Structured questionnaires were used for quantitative methods and interview with key informants were used for qualitative methods to generate data on the solid waste management practices and perception in Madina of the Ga East Municipality.

3.3 Study Area

The study was conducted in Madina one of the sub-municipalities of the Ga East Municipality. Madina is one of the four zonal councils of the Assembly, which is made up of three electoral areas (Nkwantanaa, Tatanaa, and Taatso) with a total population of 108,825. This study concentrated in the Nkwantanaa community of Madina. It has a mixed settlement comprising of high, medium and low-density residential areas. It is the only level 1 settlement with most facilities including residential and central functions.

These include a court, senior secondary school, banks, clinics and well established market.

The Ga East municipality is made up of four sub-municipalities namely; Madina, Danfa, Taifa, and Dome. It is bounded in the North by Akuapin south district, West by the Ga West, East by Tema municipal and South by Accra Metropolitans. It lies in the North-eastern part of Greater Accra region. However, there are four communities comprising mixed settlement, urban, peri-urban and rural areas and it constitutes 82% of urban population. This indicates a densely populated urban area with its associated pressure on social infrastructure and land. Land litigation, encroachment on the few open spaces; overcrowding and construction of illegal structures are some of the development challenges the assembly has to manage.

3.3.1 Climate

Rainfall pattern is bi-modal with the average annual temperature ranging between 25.1^{oc} in August and 28.4^{oc} in the February and March. February and March are usually the hottest months. The district falls in the savannah agro-ecological zone.

3.3.2 Housing

The municipality lacks sufficient housing units, especially in the urban areas of the district which has among other things contributed to overcrowding, development of illegal structures conversion of commercial facilities to residential use, streetwise and pressure on social facilities and amenities. This therefore has resulted in the development of slums in areas like Madina and Adenta West popularly called Grovy.

3.3.3 Health facilities

A total of thirty nine (39) health facilities have been recorded in the district. Public facilities constitute only 12 % (6). Thirty one are private, 1 CHAG and 1 quasi government health facility.

3.3.4 Festivals

Two major festivals, namely Dokobi are celebrated by Sessemi inhabitants and Homowo celebrated Boi, Teiman and the other communities in conjunction with Teshie and La inhabitants.

3.3.5 Economic Activities

In the municipality, public services and trading are dominant in its occupational scene, followed by farming and crafting. Besides, a sizeable proportion of the working force in the district is unemployed reflecting the high poverty level and for that matter their inability to pay for health services offered them.

3.4 Population

The study population were selected heads of households in the Nkwantanaa electoral area of the Madina sub-municipal. Six Key informants of the municipality were also interviewed.

3.5 Variables

The following are variables of the study.

- Dependent Variable –Waste Disposal Practice

- Independent Variables – Demographic characteristics (Age, sex, gender, religion, marital status, and place of residence), types of waste generated at home, perception of solid waste management, socio-cultural factors.

3.6 Sample Size

The Ga East, the area of study, has an estimated population of 108,825, as obtained from the Municipality's 2008 report. The sample size was calculated using Epi info version 3.5.1 at 95% confidence interval and a margin of error of 5%, a sample of 384 was estimated. Hence the figure was rounded up to 400 for non response rate. A total of 400 questionnaires were administered, only 364 participants responded correctly.

3.7 Sampling Procedure

This study combined systematic sampling and purposive sampling techniques in selecting the sample. Madina sub-municipality was divided into three electoral areas and households within the Nkwantanaa electoral area were selected using simple random sampling methods to get research participants. The first household was selected following the results of spinning a bottle and after that every fifth house was interviewed.

Key informants (6 persons) were selected purposively based on knowledge about the community as it relates to waste management. Those interviewed were 4 officers from the Zonal Council of Madina, Department of Environmental health and sanitation unit, an assembly man, and an officer of a private refuse contractor. Purposive sampling method adopted was useful because it allowed for key informants to be selected according to their characteristics, which relate to the problem area to provide in-depth information about the problem being studied.

3.8 Data Collection Instruments/Tools

Data collection tools were questionnaire and in-depth interview guide. A questionnaire was developed and administered to all the respondents. Some items in the questionnaire were open ended so that respondents could express their views. The guide was in-depth, focused on knowledge and perceptions of solid waste management. These instruments employed in the study provided the findings on waste management practices and perceptions at the study area, located in the Ga-East Municipality of Ghana.

3.9 Quality Control

The Questionnaires were pre- tested in a community with similar characteristics to ensure that the questions were well suited for the study area before data collection. Unsuitable questions were revised appropriately. Research Assistants were trained to administer the questionnaire to participants, and to translate the questionnaire into local languages for the participants to understand.

Also daily check of retrieved questions for completeness and consistency, as well as monitoring of employed Research Assistants aimed at ensuring that data was appropriately collected from respondents. There was double entry of questionnaires to ensure data quality.

3.10 Data Processing and Analysis

Quantitative data obtained from the field was captured and analyzed with the aid of two computer software. They were Statistical package for social sciences (SPSS) and Epi info version 3.5.1 was used for data entry and then the data was imported into SPSS version

16 for data analysis of quantitative data. This approach allows the ability to carry out descriptive analysis and cross tabulations where appropriate. More importantly, the use these software enabled the presentation of the findings in tables with frequencies, percentages and graphs where necessary.

On the other hand, qualitative data obtained by using a cassette recorded were transcribed, analysed by themes. Analysis of qualitative data began with general critical reading to develop a system of coding for the verbal responses. This was followed by thematic framework procedures to create the appropriate charts for data reduction to enhance easy reading. After careful juxtaposition of the data, recurrent categories were identified from which specific themes emerged. To ensure that the themes were consistent with and reflect the opinions of participants, a draft summary of the themes were printed sent to the various participants for discussions and comments for any addition or omission of any issue before they were included in the final analysis. Feedback showed that the participants endorsed all the themes.

3.11 Ethical Considerations

The study had approval from the Ethics Review committee of the Ghana Health Service. The purpose of the study was explained to the participants and the consent of all respondents was solicited before administering the questionnaires or conducting interviews in the communities of Madina. In addition, permission to proceed was sought from Opinion leaders in the communities**.** The informants and opinion leaders were assured confidentiality. Also, the Director of the Municipal health management team (MHMT) gave the final approval before the study was conducted.

CHAPTER FOUR

RESULTS

4.0 INTRODUCTION

This chapter captures the findings of the study and presents them by the socio-demographic characteristics of respondents, households characteristics, types of solid waste generated and disposal methods, and household perceptions toward solid waste management.

4.1 Socio – demographic characteristics of respondents

Table 4.1 show the socio-demographic of the 364 respondents

The sex of the respondents was almost even with 49.7% (181) being males and the remaining 50.3 %(183) were females. The modal age of the respondents was between 31-40 years. A total of 40.4 %(147) of respondents were in this group. Out of the respondents interviewed, 57.7% (210) were married and the remaining 42.3% (154) were single whilst 48.0% (175) were Christians, 42% Muslims and the rest were of the traditional belief. Some 49.1% (179) of the respondents had basic education, 38.2 % (139) attained Senior/higher educational level while the rest 12.6% (46) had no formal education. Two hundred and sixty seven (73.4%) were employed whilst the remaining 26.6% (97) were unemployed. The respondents of the study came from all the ten regions of Ghana, suggesting a general representation of the various geographical sectors of the country. The middle belt (Ashanti, Brong Ahafo and Eastern region) was recorded the highest 41.7% (152), Costal belt (Central, Volta and Western regions) with 38.2% (139) while the least 20% (73) is in the Northern belt (Upper East, Upper West and Northern regions).

Table 4.1 Socio – demographic characteristics of respondents

CHARACTERISTIC	FREQUENCY(N=364)	PERCENT
Sex		
Male	181	49.7
Female	183	50.3
Age in years		
21 – 30	77	21.1
31 – 40	147	40.4
41 – 50	80	22.0
51 – 60	39	10.7
61 and above	21	5.8
Marital status		
Single	154	42.3
Married	210	57.7
Religion		
Christian	175	48.1
Muslim	155	42.6
Traditional	34	9.3
Level of education		
None	46	12.6
Basic education	179	49.1
Senior/ Higher	139	38.2
Employment status		
Employed	267	73.4
Not employed	97	26.6
Region of origin		
Northern belt	73	20.0
Costal belt	139	38.2
Middle belt	152	41.7

4.2 Households characteristics

Table 4.2 shows the characteristics and possession of 364 households in Madina.

Most of the respondents, 48.1 %(175) receive a monthly earning ranging from GH¢100 to GH¢399. In all, 21.7% (79) of the respondents receive less than GH¢100; 22.3% (81) between GH¢400-GH¢799 and only 8.0 %(29) received GH¢800 and above. Majority of the respondents 39.6 %(144) live in compound houses; while the least 11.8% (43) live in flats.

The average household size was 7 individuals. About 50% of the respondent indicated that they have about 5 to 9 people in the same house whereas 31.9% reported having 1 to 4 people living in the same house. The minimum household size was 3 while the maximum household size was 19. Out of the 364 respondents, 74.2% (270) admitted cooking in the house as against 25.8 % (94) who do not cook at home. Not only is the number of respondents that cooked in home high, but also, the frequency of cooking is high. In terms of the number of times respondents cook at home, 77.8 % (210) indicated that they cooked at home daily, 11.9% (32) cooked every other day, 5.5 % (15) cooked three times a week whist 4.8%(13) cooked weekly. Out of the 364 respondents, only 26.1 %(95) do not have electricity in their houses against 73.9 %(269) who have.

Table 4.2 Household characteristics and possessions of respondent

CHARACTERISTIC	FREQUENCY(N=364)	PERCENT
Monthly earnings in GH¢		
Less than 100	79	21.7
100 – 399	175	48.1
400 – 799	81	22.3
800 above	29	8.0
Residential unit		
Detached house	90	24.7
Semi – detached house	87	23.9
Flats	43	11.8
Compound house	144	39.6
Electricity in house		
Have electricity	269	73.9
Do not have electricity	95	26.1
People living in your household		
1 – 4	116	31.9
5 – 9	182	50.0
10 – 14	50	13.7
15 – 19	8	2.2
>19	8	2.2
Cook at home		
I cook at home	270	74.2
I don't cook at home	94	25.8
Cooking schedule*		
Daily	210	77.8
Every other day	32	11.9
Three times a week	15	5.5
Weekly	13	4.8

*Calculated from those who cook at home

4.3 Types of solid waste generated at home and disposal methods

Table 4.3a and table 4.3b show the types of solid generated and disposal methods by households.

Food debris seems to be the major waste generated in the study area. From the multiple responses, 93.1% (339) generates food debris as a solid waste; 64.3 %(234) of the total respondents generate plastic solid waste; 36.0 %(131) paper; 47.3 %(172) bottles/cans;

and 21.2 %(78) old clothes. Most 82.7% (301) of them do not separate their solid waste into different types before disposal where as 75 %(273) do not cover their waste during storage.

Similar views were shared during the in-depth interviews.

> "If the people too will be sorting out from their houses it will make it a bit easier because the contractors have been complaining a lot and those who put the refuse in the truck also complain about fecal waste being part of the refuse (a male respondent)".

> "The issues of sorting, emm.., it is hard to explain because at most time when we make our rounds we encouraged them to do so but they will always complain that they don't have time for that and in fact the dust bins are inadequate for such purpose (a female respondent)".

Out of the 364 respondents, 61%(222) disposed their waste at the appropriate designated sites which included the big communal bins and dump trucks of paid collection services while 39%(142) of the respondents practice indiscriminate (crude) dumping(on the streets, in the bush, nearby gutters or in the hole)

A similar response was confirmed by these quotes:

> "The aspect of the crude dumping is very serious, sometimes we find solid waste in gutters, on the street but we are trying to do something about that"(a male respondent).

> "The assembly has prioritized solid waste; formally people were dumping their solid waste anywhere either around the house and even in the gutter and others takes it to the communal dust bin in the market"(a female respondent).

Household conveyance of the solid waste to the community disposal centre is mainly done by contracted agents as 34.3% (125) respondents indicated paid collection as the means of transportation. Others also convey waste by themselves 85 23.4 %(85) or through their children 24.5 %(89), housemaids 14.0 %(51) and other means 3.8 %(14). Some of the key informants reveal similar views:

> "But now the assembly has invested some money and they informed the zonal community and encourage them to register their houses to the private contractors and they give them twice a week service to collect their solid waste (a female respondent)".

> "Now we have about two active private contractors, they are Amanieh and Zoom lion and they are responsible for collection of solid waste from household and transportation to the final disposal site"(a male respondent).

All the 125 of the households who dispose waste through private contractors indicated that they paid for collection and disposal. This was confirmed by some of the key informants.

> "They private operators charge GH¢8.00 and GH¢10.00 respectively" (a male respondent.

It was however discovered that the charges are made according to type of residential area by another key informant.

> "In the assembly's regulation, the private operators are supposed to charge GH¢5 for 3rd class residential area, GH¢8 for 2nd class and GH¢12 for 1st residential areas for a month. It however sometime varies because the contractors normally make special agreements with the households and maybe instead for twice a week collection, they do daily collection which attracts additional fee" (a male respondent).

> "The amount is collected through assembly-managed representatives who collect between 20-50 pesewas depending on the volume of waste the individual carries however emphasized that it is unofficial (a female respondent)".

The extent of satisfaction for solid waste management services in that community is low, only 37.1 %(135) is satisfied. The in-depth interviews also confirmed the finding;

> "Even zoom lion, they are not meeting the expectation of the people because they are expensive and not everyone can afford it. My little advice is the every assembly has the power to decide whether to work with zoom lion or not. Instead it is zoom lion that decides on what to do in this community (a male respondent)".

> "My people always complain that they are not satisfied with the services provided. Normally the refuse is to be collected twice a week but sometimes they come after two weeks to collect the refuse so most times in such situation my people depend on the central containers (a male respondent)".

"Zoom lion! They are not working to our satisfaction. The assembly actually have to get more contractors because I think the load is too heavy on zoom lion (a female respondent)".

Table 4.3a Types of waste generated by households*

TYPES OF SOLID WASTE GENERATED	FREQUENCY	PERCENT
Food debris	339	93.1
Plastic	234	64.3
Paper	131	36.0
Bottles/cans	172	47.3
Old clothes	78	21.2

*Percentages calculated are from open responses.

Table 4.3b Waste disposal methods by households

CHARACTERISTICS	FREQUENCY	PERCENT
Separation of solid waste		
I do not separate my waste	301	82.7
I separate my waste	63	17.3
Sites of solid waste disposal		
Appropriate disposal sites	222	61
In – appropriate disposal sites	142	39
Transportation of waste		
Self	85	23.4
Children	89	24.5
Housemaid	51	14.0
Paid collection	125	34.3
Others	14	3.8

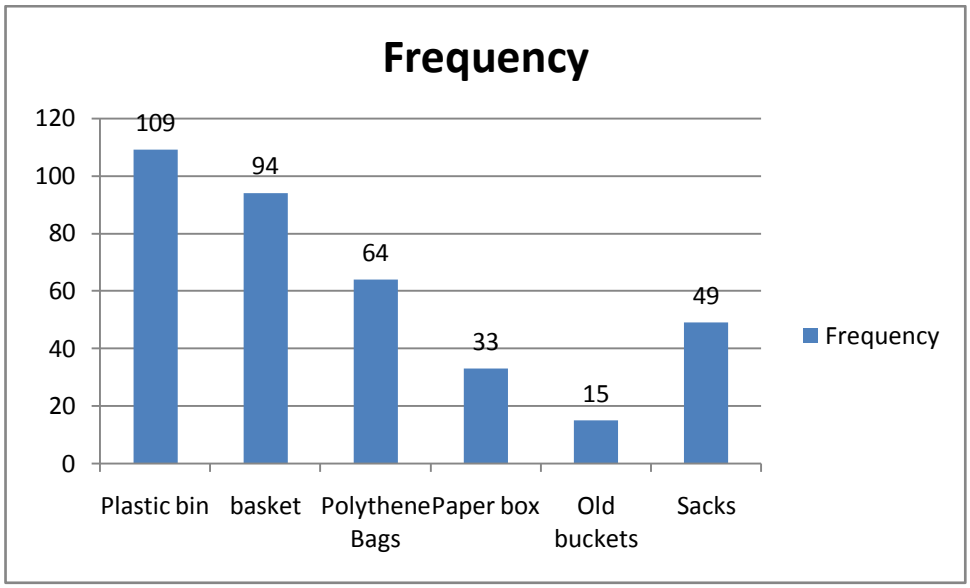

Figure1: Graph showing the types of storage bins used by households

Figure 1 present the storage bins use by households.

The two most predominant storage items for solid waste were plastic bin 29.9 %(109) and basket 25 %(96). The remaining respondents make use of the polythene bags 17.6% (64), paper box 33(9.1%), old buckets 4.1 %(15) and others 13.5% (49).

4.4 Household perception towards solid waste management

Table 4.4 Perceptions of households toward solid waste management (n=364)

CHARACTERISTIC	FREQUENCY	PERCENT
Do you think waste management is important		
It is important	261	71.7
It is not important	72	19.8
Do not know whether it is important	31	8.5
Responsibility to clean		
Children	305	83.8
Community members	35	9.6
District assembly	22	6.0
Private operators	2	0.5
Disease/ illness *		
Cause a disease	303	83.2
Do not cause a disease	56	15.4
Do not know if it cause a disease	5	1.4
Kinds of disease/illness *		
Malaria	171	56.4
Diarrhoea	74	24.4
Typhoid	38	12.5
Others	20	6.6
Do you educate your household		
Do education	195	53.6
Do not do education	169	46.4
Motivation to dispose your waste^		
Cleanliness	203	55.8
Fear of illness	187	51.4
Smell / odour	31	8.5

***Calculated from 303 respondents who answered yes.**
^Percentages calculated are from multiple responses.

Majority, 76.5 %(261) of the respondents are that solid waste management is important. Also most 83.8% (305) report that children are responsible to clean the environment, while 39.6% (35) indicate community members, 6.0% (22) report the assembly is responsible and only 0.5 %(2) report private contractor should be responsible. Almost all of the respondents 83.2% (303) report that improper solid waste management causes

diseases or illnesses against 15.4 %(56) who said it does not cause a disease and only 1.4%(5) indicated that they do not have any idea. Among the 83.8% (303), malaria 56.4% (171) was the highest disease indicated, followed by diarrhoea 24.4% (74), typhoid 12.5% (38) and the others 6.6 %(20) indicated worm infestation, Cerebral spinal meningitis and food poisoning. Some 53.6 %(195) indicated that they educate their households on good waste management practices against 46.4% (169) who do not do any form of education. From the multiple responses, 55.8% (203) household said they dispose their waste because of cleanliness, 51.4% (187) said for fear of diseases and 8.5 %(31) because of the smell or odour. The extent of motivation for waste management in the area may be summarized in the following assertion by key informant.

> "We called it waste because we no longer need it. It is not good for our human's bodies and that's why we throw it away. Imagine if it was not eliminated- it chokes the gutter and by choking the gutters, it serves as breeding ground for mosquitoes which transmit malaria and other disease" (a male respondent).

> "A lot of them although I am not a health officer, but you know when you are living with waste you can never be healthy. So yes to be frank, Madina as you can see the town is developing and lot of people are moving here and businesses are booming here. So if we do not rise up and begin to address this challenge, and in fact, we fear that one day there will be an epidemic" (a male respondent).

Two hundred and seventy eight respondents (76.4%) said they will be willing to pay more when better waste disposal practices are employed, with the remaining 23.6 %(86) indicating unwillingness to pay for such service.

CHAPTER FIVE

5.0 DISCUSSION

This chapter presents the discussion of the findings. It concentrates on domestic solid waste generation and disposal methods, perceptions and socio-cultural factors affecting waste in Madina.

5.1 Domestic Solid waste generation and disposal methods

5.1.1 Waste generation and composition

The study revealed that solid waste generated by households include, food debris 93.1 % (339), plastic 64.3% (234); paper 36.0 %(131); bottles 47.3 %(172); and old clothes 21.2 %(78). Food debris is generated in almost all the homes. The high generation of food debris can be attributed to the high number 74.2 %(270) of people who admitted cooking in the house. Not only is the number of respondents that cook in the home high, but also, the frequency of cooking is high. In terms of the number of times respondents cook at home, (77.8%) 210 admitted that they cook at home daily. A study done by Yusof et al., (2007) confirmed that those who do their cooking more often generate more domestic wastes than those who do not cook often. Results from my study indicated that some of the respondents dump waste on the open streets, gutters, holes and in nearby bushes. This could cause breeding grounds for rodents and insects which can increase the risk of the spread of zoonotic diseases. Again, food debris disposed off indiscriminately could give rise to choked drains and blockage of waterways. Furthermore, it has the possibility of causing flood during the wet season.

The high (64.3%) plastic waste generated by households from this study supports the findings of Ackankeng (2003) that plastic waste generation is on the increase in African cities. This phenomenon of the increase in plastic waste is likely to have implications on disposal since plastic is not biodegradable. Most often, waste is burnt in the open air at the final disposal sites. Burning of plastic waste will add up to the toxic gaseous emissions into the atmosphere, polluting the air and destroying the ozone layer and its protective properties thereby increasing the risk of health hazards including cancers. Apart from that, the high quantities of plastic waste generated could put financial and socioeconomic losses on Assemblies and Governments at large when trying to managed it. Studies by Azeez(2006) also confirm that over 77.9 % of households' generated plastic waste as a component of their domestic waste. Also plastic wastes seem to be running through almost all the waste generated at home. This is consistent with earlier studies by Haque and Bell (1998) who explained that this could be due to change in life style and industrialization where plastic packages replace other forms of packing.

5.1.2 Storage items

Some, 29.9% (109) of the respondents used plastic bins followed closely by 25.8% (94) who used baskets for storage of their solid waste. The percentage is low whereas a study done by Azeez (2006) revealed that 54.3 % of the respondents use plastic bin for storage of domestic waste, while 32.3% used baskets. Patterson (1979) found out that between the years 1900 – 1940 Accra internal storage facilities were traditional baskets; paper, metal and wooden boxes in homes. A report on Environmental Sanitation by WHO (1999) recommends the use of cover plastic bins for storage of domestic waste. This is to

facilitate easy cleaning and protect the waste from direct contact with flies, vermis and scavengers and they also prevent odour nuisance and unsightliness (Stanyard, 1982). Although the use of plastic bins recorded the highest responses, its use could still be considered as inadequate since only 29% of the population used them. Increasing awareness for the use of plastic bins could reduce indiscriminate disposal and improve collection of waste.

5.1.3 Separation of waste

Most of the respondents do not separate their waste, out of the 364 households, only 17.3% (63) separate the waste when storing while the remaining 301 (82.7%) do not do any kind of solid waste separation. This finding agree with a study done in Nigeria by Longe et al., (2009) which found that household waste of different sources are mixed and co-disposed without any form of segregation and sorting. Also, Sam (2002) in his studies found that in developing countries there is no waste separations at the sources of generation, municipal solid wastes are usually put together. The situation creates a suitable environment for breeding of disease vectors such as mosquitoes and cockroaches and the proliferation of rodents such as rats and mice which is a threat to public health. This is in consonance with the finding by Kelly, (1993) that said that in order to reduce cost of treatment of domestic waste there is a need to separate waste at source. Stanyard (1982) added that the use of colour codes containers to store different types of solid waste had been in practice in developed countries for over four decades is reported to offer a more cost – effective waste management services. Also Damghani et al. (2007)

recommend that household waste separation and source reduction are two main methods for reducing the amount of waste landfill.

5.1.4 Waste disposal sites

Although, 61 %(222) of households seem to practice appropriate methods of solid waste disposal specifying 168 (42.6%) who use community bin and 18.4 %(54) as through means of paid contractors, however, some 39 %(142) households still dispose their waste in the street, gutters, bushes and in any open hole. The Ghana land fill guideline (2002) noted that the current practice of solid waste disposal in the country has largely been by uncontrolled dumping in places such as abandoned quarry site, valleys, beaches and drains. These dumping sites are major threats to human health and the environment.

Coleman (1981) describes pre-1960's disposal practices as being governed by the philosophy of out of sight out of mind. The disposal of residual solid wastes on the land is the ultimate end-point for any waste management system. It is a delusion to believe that the problems posed by wastes come only from waste storage or collection activities. Unfortunately, open dumping is currently the world's most common disposal method. Solid wastes pose significant threats to public health and the environment if they are not stored, collected and disposed of properly.

5.1.5 Transportation of solid waste

Some 34.3 %(125) of the respondents indicated that transportation of their waste is done by paid collection through Zoomlion while 24.5% of the respondents use children to transport the waste to the communal bin. A study done by Asase et al., (2009) in Kumasi

found that the house - to- house (curbside) solid waste collection which utilize compactor trucks and communal solid waste collection are means of disposal. Eight- percent of the waste generated is collected in the municipality. The waste collection service in the city is carried out by private sector under various agreements with the metropolitan assembly which confirm my study because although some of them use the communal bin some are making use of the private contractor. The Millennium Development Goals provide a framework for assessing the relevance and importance of private sector participation in solid waste management in our efforts to improve the lives of urban dwellers. The impacts of private sector participation in solid waste management on these goals cannot be ignored. In particular goal seven lays emphasis on ensuring environmental sustainability (Coad and Batz, 2005).

Generally 62.9% (229) households were not satisfied with the solid waste management services in the community. Most respondents complained of irregular patterns in waste collection and a high cost burden of contracting private collectors. According to the EPA (2002) generally solid waste services in most developing countries do not satisfy the full demand in urban areas.

5.2 Perceptions and Socio-Cultural factors affecting disposal of solid waste

5.2.1 General perceptions

In all, 48.1% (175) of the respondents earn between 100 – 399 GH¢. This suggest that the income levels may be low in this community and could be the reason why some could not afford to use private collectors since charges were considered high by community

members. Respondents with low incomes might prefer to spend their earnings on food and shelter rather than on waste disposal.

The perceptions of the people generally seemed to be fairly low. Although 76.5% report that waste management in important, 83.8% report that it is the responsibility of children to managed waste and not the authorities. Since these people did not see disposal as an important issue it is not likely that they will improve waste disposal practices and management practices. This finding is however not consistent with findings from Norley (2009) who found that general waste Management in Ghana is perceived as the responsibility of the Ministry of Local Government and Rural Development, which supervises the decentralized Metropolitan, Municipal and District Assemblies (MMDAs).

From observation the compound houses were densely populated. This social stage may set the pace for the generation of more waste in the community and attitudes towards waste disposal by few could result in the whole compound house practicing similar disposal styles or behaviour. Dense population and increased consumption have been shown to increase more waste and increase disposal problems (Mosler et al., 2006).

The finding also revealed that 21.1% (72) and 8.5% (31) of the household's head do not think and know whether waste management in important. This could be because 12.6% (46) of them do not have any formal education. This confirms the growing perception in Ghana that low levels of education contributes and accounts for poor waste management practices in the country. Other factors accounting for this situation are poor attitudes, lack of concerns to environmental issues, high levels of poverty and unguided waste disposal practices (Norley, 2009).

In Ghana however, regulatory authority is mainly vested in the Environmental Protection Agency (EPA) under the auspices of the Ministry of Environment and Science. The Metropolitan, Municipal and District Assemblies are responsible for the collection and final disposal of solid waste through their Waste Management Departments (WMDs) and their Environmental Health and Sanitation Departments. Increasing rural-urban migration into the Ga East municipality thus compounded the problem of waste management as citizens lack the responsibility of adequate waste disposal and rather rely on government to dispose waste. This in part may be due to poor attitude of the people and lack of concern about the environment and public health (Ga East profile, 2008).

About 84% of the respondents are aware that improper waste management leads to sicknesses or diseases. This high level of knowledge on the effects of waste management does not correspond to the practices observed. The household heads that educate their occupants of the home have several reasons for they disposed off their waste to include cleanliness, fear of diseases and smell or odour.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

6.1.1 Domestic solid waste management and disposal methods

The solid waste generated at home were largely food debris and plastic, these are disposed off without separation and store in uncovered plastic waste bin of which some are disposed appropriately at communal sites while some practice crude dumping(in gutter, hole, street and in the bushes). Most of them said they would be happier if more collecting bins were provided, education and regular collection of solid waste from disposal sites and some are willing to pay more if the charges are increased.

6.1.2 Perceptions and socio cultural factors affecting solid waste management

Majority of the households were aware of the health implication of waste, although they had some form of basic education. They perceived that children should be responsible for waste management. Most the respondents think that improper waste management can lead to malaria followed closely by diarrhoea. Proper waste management can lead to improvement in the quality of the environment while on the other hand poor waste management can lead to air pollution, breeding of mosquito thus causing disease.

6.1.3 Summary of conclusions

On the average, households monthly earnings seem to be low, there is also low level educational background among the population and inadequate sanitation facilities was

high among them. They nevertheless managed their solid waste to a certain degree and were aware of the health implications of not managing waste properly; however they indicated that children are responsible for management of waste. Interestingly, they cherished improved waste management practices and are willing to pay for improve services. With a little push, support, and education to improve people practices and perceptions on waste management, some of the challenges confronting the municipality can be minimized.

6.2 Recommendations

Findings from the study identified the need for the municipality assembly, stakeholders as well as individuals and communities to play major roles in waste management in other to improve the health of the public and the quality of the environment.

6.2.1 Recommendation for Municipality assemblies

The Assembly should collaborate with private contractor for the provision of sanitary facilities and services. The assembly should also do regular checks on the services provided by the private contractor. Also staff of the Assembly should be appropriately trained and motivated to provide effective and efficient services to the people.

The authorities in collaboration with MLGRD should draft policies and national waste management plans that would be given directly to the Regional and Municipality administrations for the implementation of the policies.

6.2.2 Recommendation for education on health and hygiene practices

The department of public health at the assembly should intensify educational campaigns designed to provide information on the health and the environmental implications of bad waste management practices.

6.2.3 Individuals and communities

Individual within the communities should be involved in waste segregation at source and practice proper disposal methods and not perceive children as being responsible for the management of waste.

6.2.4 Recommendation for further Research

The socio cultural factors affecting waste management was not very clear in this study; therefore there is a need for further research in this area.

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APPENDICES

Appendix 1

QUESTIONNAIRE

Form no..... **Date of interview.....**

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

1. Sex		Code
Male	[ ]	1
Female	[ ]	2

2. Age of respondents (in complete years)……..

3. Level of Education		
None	[ ]	1
Elementary/primary education	[ ]	2
Junior Secondary School (JSS)	[ ]	3
Senior Secondary School (SSS)	[ ]	4
Tertiary Education	[ ]	5

Others (specify): ……

4. Marital Status		
Single	[ ]	1
Married	[ ]	2
Divorced	[ ]	3
Widowed	[ ]	4
Widower	[ ]	5
Separated	[ ]	6

Others (Specify): ……

5. Religion		
Christian	[ ]	1
Muslim	[ ]	2
Buddhist	[ ]	3
Traditional	[ ]	4

Others (Specify): ……..…

6. Region of origin		
Ashanti	[ ]	1
Brong Ahafo	[ ]	2
Central	[ ]	3
Eastern	[ ]	4
Greater Accra	[ ]	5
Northern	[ ]	6
Upper East	[ ]	7
Upper West	[ ]	8

Volta	[ ]	9
Western	[ ]	10

7. Are you working?

Yes	[ ]	1
No	[ ]	2

8. Occupation

House wife	[ ]	1
Nurse	[ ]	2
Teacher	[ ]	3
Administrator	[ ]	4
Manager	[ ]	5
Business man/woman	[ ]	6
Student		
Others (specify)…….		

9. Income levels (per month) in new Ghana Cedis

Less than 100 Ghana Cedis	[ ]	1
100 – 499 Ghana cedis	[ ]	2
500 – 899 Ghana cedis	[ ]	3
900 or above	[ ]	4

10.Do you have electricity in your house?

Yes	[ ]	1
No	[ ]	2

SECTION B. DOMESTIC WASTE MANAGEMENT

11. What solid waste do you generate in your house? (Tick as many as possible)

Food debris	[ ]	1
Plastic	[ ]	2
Paper	[ ]	3
Bottles / Cans	[ ]	4
Old clothes	[ ]	5
Others (specify)…….		

12. What do you use to store your waste at home?

Polythene bags	[ ]	1
Baskets	[ ]	2
Paper box	[ ]	3
Plastic bin	[ ]	4
Old buckets	[ ]	5
Others (specify)……..		

13. Do you separate waste into different types before storage?

Yes	[ ]	1
No	[ ]	2

14. Do you cover your solid waste in your home?

Yes	[ ]	1

No [ ] 2

15. How do you transport your solid waste to the disposal site?
Self [ ] 1
Children [ ] 2
Housemaid [ ] 3
Paid collection [ ] 4
Others (specify)……..

16. If paid collection, how much do you paid for the services
Write in complete amount……..

17. Are you satisfied with the service?
Yes [ ] 1
No [ ] 2

18. How regular do you empty the waste from the house?
Daily [ ] 1
Twice a week [ ] 2
Every other day [ ] 3
Three times a week [ ] 4
Weekly [ ] 5
Others (specify)…….

19. Do you treat the waste before disposal?
Yes [ ] 1
No [ ] 2

20. If yes, how do you treat it?
Burning [ ] 1
Sorting [ ] 2
Adding chemicals [ ] 3
Compacting [ ] 4
Others (specify)……

21. Where do you dispose of your waste in the community?
In the community bin [ ] 1
On the streets [ ] 2
In the nearby gutter [ ] 3
In the valley / hole [ ] 4
Others (specify)……

22. Is the waste covered during transportation?
Yes [ ] 1
No [ ] 2
Don't know [ ] 3

23. Who collects the waste from the waste dump?
District Assembly [ ] 1
Private Operators [ ] 2
Community organized clearance [ ] 3

Don't know
Others (specify)……

24. Is it collected regularly?

Yes	[ ]	1
No	[ ]	2

25. If yes, how regular is waste collected from the waste dump?

Daily	[ ]	1
Twice a week	[ ]	2
Every other day	[ ]	3
Three times a week	[ ]	4
Weekly	[ ]	5

Others (specify)…….

26. Is waste cover during transportation?

Yes	[ ]	1
No	[ ]	2

Don't know

27. If better waste management practices are employed, are you willing to pay?

Yes	[ ]	1
No	[ ]	2

SECTION C: LIQUID WASTE MANAGEMENT

28. Do you have toilet facility in your house?

Yes	[ ]	1
No	[ ]	2

29. If yes, what type of toilet do you have in your house?

Bucket latrine	[ ]	1
KVIP	[ ]	2
Water closet	[ ]	3
Open pit latrine	[ ]	4
Others (Specify)	[ ]	6

30. If no, where do you dispose off your feces?

On the streets	[ ]	1
In the waste bin	[ ]	2
Around the house	[ ]	3
At the river edge	[ ]	4
Use of public facilities	[ ]	5

Others (Specify)……

31. Do you have portable water in your house?

Yes	[ ]	1
No	[ ]	2

32. If yes, what source of water do you have?

Pipe borne water	[ ]	1
Well	[ ]	2
Bore hole	[ ]	3

Others (Specify)…….

33.If your water is pipe borne, how frequent does it flow in a week?

Every day	[ ]	1
Once a week	[ ]	2
Twice a week	[ ]	3
Three times a week	[ ]	4
Not regular	[ ]	5

Others (Specify)……

34.If no, how do you get water for domestic use?

From the community well	[ ]	1
Buy water	[ ]	2
Go to public places	[ ]	3

Others (Specify)……

SECTION D: SOCIO-CULTURAL FACTORS

35.What type of residential unit do you live in ?

Detached house	[ ]	1
Semi-detached house	[ ]	2
Flats	[ ]	3
Compound house(s)	[ ]	4

Others (specify) …….

36. How many people live in your house?

1-4	[ ]	1
5-9	[ ]	2
10-14	[ ]	3
15-19	[ ]	4
>19	[ ]	5

37. Do you cook at home?

Yes	[ ]	1
No	[ ]	2

38.If yes, how often do you cook?

Daily	[ ]	1
Every other day	[ ]	2
Three times a week	[ ]	3
Weekly	[ ]	4

Others (specify)……..

39.If no, where do you eat?

Restaurant	[ ]	1
Chop bar	[ ]	2
Street vendors	[ ]	3

Others (specify)……..

SECTION E: PERCEPTIONS OF PEOPLE

40. Whose responsibility to clean the surroundings?

Individual	[ ]	1
Community members	[ ]	2
District Assembly	[ ]	3
Private Operators	[ ]	4
Children	[ ]	5

41. Do you think it is appropriate for individuals to clean their own surroundings?

Yes	[ ]	1
No	[ ]	2

42. Do you think waste can create ill health in your community?

Yes	[ ]	1
No	[ ]	2
Don't know	[ ]	3

43. If yes, what type of ill-health can waste cause?

Malaria	[ ]	1
Diarrhea	[ ]	2
Typhoid	[ ]	3
Worm Diseases	[ ]	4

Others (Specified)……..

44. Do you often take the chance to educate your household to dispose waste regularly?

Yes	[ ]	1
No	[ ]	2

45. What motivate you to regularly dispose your waste?

Cleanliness	[ ]	1
Fear of illness	[ ]	2
Smell/Odor	[ ]	3
Healthy	[ ]	4

Others (Specify)…….

46. Do you involve children in the household solid waste disposal?

Yes	[ ]	1
No	[ ]	2

47. Do you see the work of the waste management personnel to be very important in Madina?

Yes	[ ]	1
No	[ ]	2

48. Would you offer any possible assistance for solid waste management?

Yes	[ ]	1
No	[ ]	2

49. Who are the people involved in the waste management in your community?

Community members	[ ]	1
District Assemblies	[ ]	2
Environmental protection Agency	[ ]	3
Others (specify)……..		

50. What role is the government is playing in waste management?

Education	[ ]	1
Provision of collecting bins	[ ]	2
Provision of transport	[ ]	3
Provide land for final disposal	[ ]	4
Enforce waste disposal laws	[ ]	5
None	[ ]	6

51. Which of the above roles would you want the government to focus on for effective management (you can tick as many you want)?

Education	[ ]	1
Provision of collecting bins	[ ]	2
Provision of transport	[ ]	3
Provide land for final disposal	[ ]	4
Enforce waste disposal laws	[ ]	5

52. What do you think the government can do to improve solid waste management in the community?

Enforcement of the regulation	[ ]	1
Provide more facilities	[ ]	2
Ensure regular collection of waste	[ ]	3
Ensure safety at the final disposal site	[ ]	4
More dust bins	[ ]	5
Others (specify)……		

Thank you.

Appendix 2. IN-DEPTH INTERVIEW GUIDE

Name/ Code: …….

Date of interview: ……..

Name of Organization: ……

1. What is your position in this organization?
2. How long have you been working on your current job?
3. How is solid waste managed in the Madina?
4. How do people perceive waste in this community?
5. How do you demarcate the collection between house to house and the central container collection?
6. Tell me about what the organization is doing about solid waste in relation of the waste collection and disposal practices in Madina.
7. What is the Assembling presently doing?
8. What are the means of domestic solid waste disposal in the Madina area?
9. Do you think domestic solid waste disposal is a problem in the Madina and if so why and what are the causes?
10. How can poor waste management contribute to the following:
    a. Bad environment condition
    b. Ill-health of the people
    c. Financial constrain on the authority
11. What do you think is the solution to the problem?
12. Who are the stakeholders involved in the waste disposal process in Madina and what has been their contribution to the current waste disposal system?

Appendix 3 CONSENT FORM FOR PARTICIPANT(S)

Form no.....

Project Title: Community practices and perceptions of domestic waste management in Madina of the Ga East District.

Principle investigator: Ramatta M. Yoada

Introduction

I am a student from the School of Public Health, University of Ghana and I am conducting a research in this community to describe community perceptions and practices of domestic waste management in Madina of the Ga East District. I would like you to participate in this study. Kindly read or have this consent form read to you before deciding whether or not to participate in this study.

Study Procedure

You have being invited to answer a few questions concerning practices and perceptions of solid waste management. Your participation in this study will last for at most 30mins and it is only for a day.

Benefit

There are no direct benefits to you for your participation in the study. However, the information obtained will be used to provide some recommendations to the authorities that would aid in solving the solid waste problems in your community.

Risks / Discomforts

The risks involved in taking part in this study include the inconveniences that the interview will cause you and the time you will spend answering the questions. Some of

the questions may also appear too personal and therefore embarrassing. However, well trained field staff will conduct the interviews in order to minimize these risks.

Confidentiality

All the information that you will provide will be treated as confidential. The completed forms will be kept by interviewers only; no other person will have access to your information.

Voluntaries

Participation in this study is purely voluntary. You can decide to refuse participation if you want. If you should choose not to participate in the study, you will not suffer in any way for it and the study will not be affected by it. If you do not feel comfortable to answer any question, you may choose not to answer it. If in the course of the interview you do not feel comfortable to continue your participation, you are welcome to withdraw from the study.

Subject's permission

I have read and understood the informed consent and conditions of this project. I have had all my questions answered, I hereby acknowledge the above and give my voluntary consent for participation in this project.

If I participate, I may withdraw at any time without penalty, I agree to abide by the rules of the project.

Signature of the participant.....

Signature of fieldworker.....

Date of interview.....

Contact

If you have any question regarding clarification of the study, you can contact Ramatta M. Yoada on the cell no. 0542595470.

Thank you.

APPENDIX 4.

FIGURE 2: GA EAST MUNICIPALITY FINAL REFUSES DISPOSAL SITE

APPENDIX 5

FIGURE 3. MAP OF GA EAST MUNICIPALITY