UNIVERSITY OF CAPE COAST

EFFECTS OF WASTE MANAGEMENT ON LOCAL GOVERNMENTS REVENUE: A CASE OF ASSIN NORTH MUNICIPAL ASSEMBLY

BY

SETH KWASI FIAFOR

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2010

DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

Signature…… Date…….

Candidate's name: Seth Kwasi Fiafor

Supervisor's Declaration

I hereby declare that the preparation and presentation of this dissertation was supervised in accordance with the guidelines on dissertation laid down by the University of Cape Coast.

Signature……. Date……...

Supervisor's Name: Mr. Alex Somuah Obeng

ABSTRACT

There have been continuing debates over the allocation of fewer funds for waste management by most metropolitan/municipal/district assemblies in the country. This work however, examines how waste management affects the economic base of the Assin North Municipal Assembly. The study also finds out; how the assembly generates its revenue, the types and volumes of waste generated, how the assembly funds waste disposal, other alternative means to fund waste disposal and how waste management has affected the assembly's resources and development. In all, 250 were targeted for the study, 242 responded. Both primary and secondary data were used. Proportionate random sampling was employed to generate the sample (primary data). The main tools employed in gathering the data were questionnaires, interview schedules and personal observation. The study revealed that a huge chunk of the Assembly's financial resources was used to manage waste.

For five consecutive years, the expenditure on waste kept on increasing as against the amount budgeted. As a result of this disturbing trend, many developmental projects embarked upon by the Assembly have stalled, since waste management competes for the same resources that are supposed to be used to develop the Municipality. The work contends that, in order for the Municipality to develop, alternative means for funding waste management should be found so as to reduce the expenditure on waste. The institution of programmes such as communal labour, educational awareness campaigns, contracting out, and others have been suggested as measures that could help reduce the expenditure on waste management.

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DEDICATION

To Mr and Mrs Fiafor who sponsored my education.

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ACRONYMS

ADB	-	African Development Bank
AMA	-	Accra Metropolitan Assembly
CCW	-	City and Country Waste
CED	-	Centre for Environment and Development
DACF	-	District Assembly Common Fund
EPA	-	Environmental Protection Agency
GAMA	-	Greater Accra Metropolitan Assembly
GWC	-	Ghana Water Company
ICMA	-	International City/Council Management Association
JSS	-	Junior Secondary School
KMA	-	Kumasi Metropolitan Assembly
KVIP	-	Kumasi Ventilated Improved Pit
MSLC	-	Middle School Leaving Certificate
NGOs	-	Non Governmental Organisations
PSDU	-	Sustainable Development and Poverty Reduction Unit
SPSS	-	Statistical Product and Service Solutions
USA	-	United States of America
WC	-	Water Closet
WTP	-	Willingness To Pay

CHAPTER ONE

INTRODUCTION

Background to the study

Management of waste is the problem that many governments both in the developed and developing world are battling with today. Through human activities, a lot of waste is generated every year and places to dump these wastes are becoming increasingly scarce since their contents are becoming increasingly unpleasant and dangerous. This has resulted in most rich nations dumping their waste especially hazardous waste and old items at the backyard of many impoverished nations and thus exposing these nations to various forms of health hazards.

Some of these waste materials produced by humans in our everyday activities include agricultural waste, food waste, and sewage sludge from treatment plants. Gaseous wastes made up of carbon monoxide, sulphur oxide, oxides of nitrogen and others. Scrap metals i.e. metals from cars, worn-out furniture and consumer products of all types are all waste materials, which pollute the environment.

Many developed countries can be cited as having achieved remarkable feat in the management of their waste and other environmental problems. They have done this in the area of recycling, composting and the production of energy using waste. Other countries for example the United States of America (USA),are still finding it difficult to find answers to about 200 billion metal,

glass, empty plastic, food and beverage containers which they generate yearly (Cunningham and Saigo, 1997).

In the past, most Ghanaian communities disposed of their wastes in open pits or by burning them with few environmental or health impacts due to sparse population. Due to changes in the types of waste generated coupled with the increase in population of the country, which tripled from 6 million in 1957 to 18 million in 2000 (Ghana Statistical Service, 2003) the volume of waste in the country has increased. This has made methods used to dispose of waste in the past no longer safe or effective in managing the waste generated in the country today. Some of these wastes are plastics; food items and household waste.

In Ghana, the Metropolitan/Municipal/District Assemblies are responsible for various operational aspects of waste management. This includes the collection, transportation, treatment and final disposal of waste as stipulated in the local government act, 1990 (Act 462). The act states that: "Assemblies should initiate programmes for the development of basic infrastructure and provide municipal works and services in the district; be responsible for the development, improvement and management of human settlements and the environments in the districts". Therefore, the Assemblies must establish, install, build, maintain and control public latrines, lavatories, urinals and wash place and also rid the various communities of filth.

In order for the Assemblies to effectively carry out these duties as contained in the local government act, they require funds. The Assemblies therefore, must mobilise the necessary funds in order to meet its constitutional responsibilities.

Waste management has become a major problem facing most metropolitan municipal and district assemblies in the country. Each year huge sums of money which could have been used to develop the country are spent on the management of waste. Based on an estimated national population of 20 million and an average daily waste production per capita of 0.45kg, Ghana generates annually about 3.3 million tons of solid waste (EPA, 2002). Accra for instance with an estimated population of 3 million and a floating population of around 300 thousand generates about 1,500 tons of solid waste per day (EPA, 2002).

The cost involved in the collection, transportation and final disposal of these wastes is huge and very alarming. Recently, it costs the Accra Metropolitan Assembly (AMA) ¢2.5 billion a month to clean up the city and plastic waste constitutes about 50 percent of that waste (Baitie, 2007). In Kumasi, the Kumasi Metropolitan Assembly (KMA) still spends about 20 percent of its budget on solid waste management, although its cost recovery was only 5 percent of the expenditure (Obirih-Opareh and Post, 2002). This expenditure on waste could have been used in the provision of schools, hospitals, roads and other infrastructure, just to mention a few.

Poor environmental sanitation continues to be a major drain on the country's weak economy through high health expenditure and loss of productivity due to illness. There have been concerns on how the just introduced national health insurance scheme could be sustained if problems of indiscriminate waste disposal are not tackled effectively.

The Assin North Municipal Assembly is facing a serious environmental degradation and public health risk. These environmental

problems include uncollected waste on streets and other public places, drainage systems, poor sanitation and persistent flooding during heavy rains. The main waste that is generated in the Municipality is solid waste since there are no major industries in the Municipality. Most of these wastes comprise of vegetable waste, plastic products and agricultural wastes. Proper disposal of these wastes is a problem due to inadequate equipment, lack of funding and other administrative bottlenecks which the Municipal assembly is facing. As a result these wastes are left in the community at the mercy of the weather and thus creating unsightly scenes and other health hazards.

The Assin North Municipal Assembly is expected by the central government to use 59% of the common fund on what it called other projects. The other projects consist of

- Economic Ventures (markets, energy, industry) social service.
- Education and Health infrastructure, sports and culture
- Administration (Human resource management, accommodation, sanitation, drainage systems, waste management and environmental protection.

Most times the common fund is not adequate to support most of these projects and with the waste management menace also looming, the pressure on the Assembly's resources becomes enormous. Revenue mobilization by the Municipal assembly is very low as compared to other Assemblies. This is mainly through property rates and some tolls from market women and other retailers in the Municipality. The residents in the Municipality do not pay any thing for dumping the waste generated. This has made the Municipal

Assembly incapable of acquiring the necessary facilities, employing and retaining the needed manpower in order to tackle the problem of waste.

The extent to which the Municipal Assembly is able to mobilize funds in order to provide the basic infrastructure like health facilities, educational units, electricity and good drinking water, will show the level of commitment they have in developing the various communities in the Municipality, but most times when district assemblies obtain funds, waste management takes a chunk of the amount realised and thus becoming a huge burden on the Assembly's resources.

For the Assin North Municipal Assembly, securing funding for waste management is the most difficult challenge it faces. Each step involved in the management of waste such as use of trucks, acquiring site for landfills, waste management materials as well as labour are very expensive, and the Municipality does not have the financial base to fully implement and support waste management programs.

The only source of funds for the Municipal Assembly is the common fund provided by the central government and revenue generated internally which is found to be inadequate. This calls for alternative ways to fund waste management in order to reduce the burden on the scarce resources of the Assemblies.

Managing waste is a big challenge to the Municipal Assembly, as the expenditure on waste management always exceeds the amount allocated for. As shown in Table 1, the yearly allocation for waste increased, for five consecutive years for the Assin North Municipal Assembly. It rose from GH ¢72,968,400 in 2003 to GH¢ 262,093,803 in 2007.

Table 1: Financial statement on waste management of the Assin North Municipal Assembly

Year	Common fund (¢) (in billion cedis)	Internally generated fund (¢)	Budget on waste management (¢)	Expenditure on waste management		
				Common fund (¢)	Internally generated fund (¢)	Total (¢)
2003	5.311	40 million	60,000,000	72,350,400	618000	72,968,400
2004	5.020	40 million	70,000,000	86,250,000	4,935,000	91,185,000
2005	5.204	50 million	100,000,000	162,532,000	4,610,000	167,142,000
2006	5.536	60 million	110,000,000	178,687,243	4,391,000	183,078,243
2007	7.531	1.2 billion	250,000,000	252,903,783	9,190,020	262,093,803

Source: Assin Municipal District Assembly, 2007

Problem statement

"Poor environmental sanitation continues to be a major drain on the country's weak economy through high health expenditure and loss of productivity due to illness: "the quality of the people has direct relationship with the prosperity of the community". "Health is wealth" (Essien, 1982:4, 5) The Assin North Municipal Assembly realizing this has committed some of its financial resources into waste management. For instance in 2003, six thousand Ghana cedis (GH¢6,000.00) representing about 1.12% of the Municipality's total revenue was allocated for waste management but at the end of the year, it increased to seven thousand, two hundred and ninety six Ghana cedis eighty four pesewas (GH¢7,296.084.00) representing about 1.4% of the total revenue of the Municipality. Again in 2004, seven thousand Ghana cedis (GH¢7,000.00) representing about 1.4% of the total revenue of the Municipality which was earmarked for waste management rose to nine thousand one hundred and eighteen Ghana cedis fifty pesewas (GH¢9,118.50) which is about 1.8% of the total revenue at the end of the year.

In 2005, ten thousand Ghana cedis (GH¢10,000.00) which were about 2% of the total revenue budgeted for waste management increased again to sixteen thousand, seven hundred and fourteen Ghana cedis, twenty pesewas (GH¢16,714.020) representing about 3.2% of the total revenue of the Municipal Assembly at the end of the year.

There was a gradual increase in the expenditure on waste management in 2006 and 2007 as can be seen from Table 1 above. There was 3.3% increase in the expenditure on waste management in 2006; while in 2007 there was an increase of 3 % (refers to Table 1). The sharp rise in both the amount budgeted

and the expenditure on waste management in 2007 can be attributed to the acquisition of a landfill site and the purchase of sanitary equipment by the Municipal Assembly.

The yearly increase in the expenditure on waste management as against the amount budgeted for has raised serious concerns among assembly members in the Municipality. Though the resources committed seem not to be adequate as has been evidenced by the uncollected waste in the Municipality, there have been suggestions that these resources could have been used to support other developmental projects such as health infrastructure, education, and roads. There is therefore the need to examine the effects of waste management on the assembly's funds and development, find other alternative means of managing waste in the Municipality so as to reduce the high expenditure on waste management.

Objectives of the study

The main objective of the study is to determine how waste management affects the revenue of the Municipality. Specifically, the study will attempt to:

- Determine how the Assembly generates its revenue.
- Examine the types and volumes of waste generated in the Municipality.
- Assess the funding of waste disposal in the Municipality.
- Assess alternative means of funding waste management in the Municipality.

- Examine the effect of waste management on developmental projects.
- Assess the effects of waste management on the Assemblies resources.

Research questions

- How does the Municipal Assembly generate its revenue?
- What are the types and volumes of waste generated in the Municipality?
- How does the Municipal Assembly fund waste disposal in the Municipality?
- What are the alternative means of funding waste management in the Municipality?
- How has waste management affected other developmental projects?
- How has waste management affected the resources of the Municipal Assembly?

Significance of the study

It is the researcher's belief that the work would expose the extent to which waste management in the Municipality, drains the coffers of the Assembly and hampers development of the Municipality. Besides, the work would assist the Assembly to explore the possible avenues to fund waste management without over reliance on the common fund of the Assembly. The study will be of importance to policy makers, administrators, NGOs, and the general public, as it will expose and make clear problems associated with financing waste management in the area and Ghana as a whole. The study will

also help the Municipal Chief Executive, Assembly members, and other stakeholders, when allocating resources for waste management in the Municipality.

The study will help decision makers and policy makers to find other avenues that can help rid the Municipality and the country as a whole of filth and also add to existing knowledge.

CHAPTER TWO

REVIEW OF LITERATURE

Introduction

This chapter reviews literature relevant to the study. The review of literature is in four main sections namely, classification and types of wastes, waste management in other countries, objectives of Ghana environmental sanitation policy and waste management services in Ghana.

Classification and types of waste

Waste is something that is left over or that is no longer needed. Waste can cause pollution and impacts on an environment if not properly managed (EPA, 1970). The new encyclopaedia Britannica (2003) defined waste disposal as the collection, processing, and recycling or deposition of the waste materials of human society. The term "waste" covers both solid waste (refuse, or garbage) and sewage (waste water).

Waste characteristics

Rushbrook and Pugh, (1999) indicate that, in order to manage waste effectively in the municipality, information about the quantities, composition and types of wastes that are generated within and around the municipality must be known. Increase in the quantities of each waste stream should also be

estimated in order to plan for future provision of facilities, treatment and the best disposal methods that should be employed.

Traditionally, municipal wastes have been classified into three general classes, residential, commercial and industrial. Residential (also termed "domestic" or "household") solid waste consists of a wide variety of wastes produced by residents in houses and apartments. The fraction produced from the preparation and consumption of food is sometimes known as the putrescible (or food of compostable) component. The other major constituents of residential wastes, in addition to the putrescible components, are glass, metal, plastics, waste paper and paper products, rubber, textiles, cash, soil, and similar debris (including broken pottery and china), bones, leather and hide remnants.

In all communities, people produce domestic waste. At the most basic level this comprises putrescible food wastes, animal manure, ashes from fires, broken tools and utensils, and old clothing. In an agricultural community this waste is readily reabsorbed in the natural cycle. Domestic animals consume the food remains and other waste materials rapidly decompose. However, since the last century there has been an increase in the number of people living in towns. Urbanization and industrial development rapidly increased the range and diversity, as well as quantity, of wastes that require collection and disposal (Rushbrook and Pugh, 1999).

The main factors that influence the composition and rate of production of solid waste include climate and seasonal variation, finance available locally to municipalities and waste service operators, economy of the region, physical characteristics of the cities, social and religious customs, public health

awareness, quality of management and technical capacity, Environmental standards required to be achieved since each has different potential effect on the type of waste produced, the waste manager needs to understand the materials he or she will be handling and disposing (WHO, 1976).

Types of waste

Domestic (residential)

Domestic or household waste arises from homes and also includes refuse or rubbish from schools. This form of waste mainly involves packaging papers, plastics, textiles, glass, metals, putrescible materials, and newsprint and food leftovers. Clinical waste is the waste that arises from medical, nursing, dental, veterinary and pharmaceutical investigation, care, teaching and research. This waste includes human or animal tissue, blood or other body fluids, excretions, drugs or pharmaceutical products, swabs, dressings, syringes, needles or sharp instruments. The type of wastes is usually harmful when one comes into contact with them unless rendered safe (Jones, 1995).

Commercial waste

This category includes waste from shops, offices, restaurants, hotels and similar commercial establishment. The waste typically consists of packaging materials, office supplies, food wastes and has a close similarity to some components of domestic waste. In lower-income countries food markets may contribute to a large proportion of this type of waste (Rushbrook and Pugh, 2003).

Municipal wastes

Wastes such as street sweeping, roadside litter, litter from municipal dustbins, dead animals and abandoned vehicles. Municipal waste includes rubbish, trash and almost all types of waste (CED, 2003).

Institutional waste

This is waste produced in establishment such as government offices, schools, hospitals and other healthcare facilities, military bases and religious buildings. The waste generally includes components similar to both domestic and commercial waste. Hospital wastes include potentially hazardous, infectious, and pathological materials such as used bandages, sharp objects including syringes, needles, and items contaminated with body fluids including blood. It is important to separate the hazardous and non-hazardous fractions in health care waste to reduce the risk to health and pollution (Rushbrook and Pugh, 2003).

Construction and demolition waste

Waste from demolished buildings and other structures are classified as demolition wastes. Wastes from the construction, remodelling and repairing of individual residences, housing complexes, multi – stored flats, commercial buildings etc are classified construction wastes. The constituents of this waste are stores, concrete, bricks, plaster and plumbing's (CED, 2003).

Sanitation waste (night soil)

In several lower-income countries no sewage networks exists within many towns to remove faeces and similar solid sanitation wastes. Specialized collectors of night soil often collect this waste separately from individual houses. This material can contaminate watercourses and become a source of infectious diseases if indiscriminately dumped. Consequently, in those cities where there are no sewage treatment facilities for night soil, it is common for this material to be used either for manure for agricultural crops or end up at the municipal landfill (Rushbrook and Pugh, 2003).

Industrial waste

Industrial waste involves materials or substances that come from the industry and such waste may be hazardous, toxic or ordinary. This includes empty oil containers and scraps. Agricultural waste includes waste that arises from agricultural practices or activities. This includes silage liquors, straw, plant stems, farm slurry that is often sprayed on farm as liquid manure and containers used for fertilizers and pesticides (Jones, 1995).

Waste management in other countries

Waste management seems not be a third world problem, many industrialized nations are also facing enormous garbage problems too. A study conducted into solid waste management in the United States of America by Paul (1990) indicates that the per capita waste production in the country is rising at an alarming rate and its management posses a great challenge to most municipalities and counties in the country. There have been many proposals

on how to manage these wastes i.e. whether to embark upon a complete privatization or some form of government private sector collaboration.

The international city/council management Association (ICMA) municipal year book survey of alternative municipal service delivery approaches (as reported in Miranda and Andersons (1994) indicates that most cities (68%) and at least one third of counties provide some type of residential refuse collection rather than depend on a pure private individual household to contractor approach.

Gardner and Wallner (1992), argues that waste management activities solely performed by government faces problems that can lead to failure. This problem, the study claims, is caused by the maintenance of service fleet of expensive single purpose garbage collection vehicles, along with personnel and other equipment necessary to operate and service them. Since city funds are involve, opportunity costs related to multiple demands on city resources occur. The study further estimates the average city in the Unites States to be having 70 refuse workers per 1000 people in its population and the average worker makes $ 17000 and $ 21000 yearly. Furthermore, compared with police and fire departments, refuse services have the highest per capita expenditures.

Williams (1998) explains that the potential expenses for a municipality that provides its own refuse collection are high, with concomitant need for an increased budgets (and, perhaps, taxes). This is not the kind of situation that municipalities and local governments envisages and therefore a form of contracting out has been proposed as an alternative in order to reduce the

deficits that local governments face in financing waste management in their various municipalities.

In October 2000, the Sustainable Development and Poverty Reduction Unit (PSDU) of the African Development Bank (ADB), commissioned a study on solid waste management options for Africa. The study provided information on waste generation, and characterization, collection and economic and institutional policies of waste management in Africa. It was confirmed during the study that urban governments in many African countries are facing serious problems with the management of solid waste.

The study observed that 10 to 15 million tonnes of solid waste are generated annually in Egypt with Cairo contributing more than 3 million tonnes. Waste management services have already been privatized in some Egyptian cities with the local government authorities awarding contracts to private companies.

In Nairobi (Kenya), the study identified eight hundred (800) to thousand (1000) tonnes solid waste to be generated daily in the city. Four hundred (400) tonnes of this waste is disposed daily by the Nairobi city council. Though the private sector is involved, private companies in Kenya remove only about 50 tonnes of municipal solid waste daily.

The study concluded with research into solid waste management in Cape Town (South Africa), Accra (Ghana) and other African nations. In all these countries it was found that, the private sector has been involved in waste management, but there has not been a corresponding increase in environmental quality in these urban centres and thus the city governments

have to incur further costs in order to provide adequate waste management services.

Ghana's environmental sanitation policy: Objective and challenges

Ghana's Vision 2020 document, the 2003 Ghana poverty Reduction Strategy, and the National Environmental Action Plan for 1991-2000 recognizes environmental sanitation as an essential factor that would contribute to the health, productivity and welfare of the population. The environmental sanitation policy formulated in 1999 was aimed at developing and maintaining a clean, safe and pleasant physical environment in all human settlements and promoting the social, economic and physical wellbeing of all sections of the population. The policy comprises of a number of complementary activities, including the construction and maintenance of sanitation infrastructure, the provision of services, public education, community, and individual action, regulation, legislation (Republic of Ghana, 1999).

The principal components are: collection and sanitary disposal of wastes; clinical and other hazardous wastes; storm water drainage; cleansing thoroughfares, markets and other public spaces; control of pests and vectors of disease; food hygiene; environmental sanitation education; inspection and enforcement of sanitation regulations; disposal of the dead; control of animal rearing and stray animals; and monitoring the observance of environmental standards. If these services are provided reliably and regularly, the policy envisages that they would go a long way to 'mitigate the negative effects of social and economic activity in human settlements' (Republic of Ghana

1999:2). Despite this policy statement which shows that waste management is an essential factor contributing to the health, productivity and welfare of the people of Ghana, Waste disposal and management continue to be the biggest problem with choked gutters, stagnant pools and heaps of waste in containers scattered along its streets. The scene at the seaside is nothing but a clear slur on all the virtues of hygiene (GWC 2000).

Waste management in Ghana

Many studies have been conducted into waste management in the country; however, these studies have tended to concentrate on the two main cities i.e. Accra and Kumasi. There are relatively few documented and substantive studies done on waste management in most rural parts of the country, which by definition are more economically deprived with poverty very prevalent.

A study conducted in Accra and Kumasi by Post (1999), indicates that about 30 percent of residential areas in Accra are served by solid waste house to house collection. He notes that solid waste collection in the city relies primarily on the central communal container (CCC) systems metal containers and skips placed at 'transfer sites' which in principle can be emptied or uplifted to bring their rubbish to the containers or in many cases, to dumps which in fact lack containers. It was also observed in the study that, the entire coverage of the system was 70 percent in Accra. In Kumasi the study found out that privatization has been offered as an option for solving the problem of waste management in the Kumasi metropolis and that residents in Kumasi wanted to change from the public to the private sector. The Kumasi

Metropolitan Assembly (KMA) was willing to make the shift. The study discusses the negative aspects of privatization. Post maintains that privatization does not always affect the economy positively since firms are not ready to be privatized because of lack of international competitiveness, financial support and managerial skills. The authors of the study found out that all but a few high-income estates in Kumasi (around 700 houses) that benefited from house-to-house collection as residents in low-income areas were not willing to pay for waste collection

Devas and Korboe (2000) present a clear picture on waste management practices in Kumasi. They analyzed the relationship between city governance and poverty in the Kumasi metropolis. They note that door-to-door collection of waste and other public services were predominantly concentrated in high-income areas with these services being ineffective in poor residential areas. The study concluded that, sanitation and drainage was a major problem confronting the KMA with only 30 percent of households having satisfactory sanitation arrangements in their houses while 24 percent use the very unhygienic system of buckets and 40 percent of residents depending on public toilets, for which there are lengthy queues.

Gyebi-Garbrah (1996) also conducted a study into the funding of waste management in Cape Coast municipality. The study reveals that Cape Coast generates about 375 tons of solid waste daily with the volume of liquid waste estimated to be around 25000 gallons daily. The District Assemblies Common Fund and other sources, which were found to be woefully inadequate, solely finance waste management in the municipality. The private sector has not been involved in waste management in the municipality. The municipal authority is

enjoying monopoly in this area, with no fees charged for service delivery. The study however concluded that some residents in the high-income areas were willing to pay for improved services.

These observations were not peculiar to these areas alone as other studies clearly show that waste management is a national problem rather than being peculiar to a particular area. Also the actual amount that was spent on waste management was not mentioned.

King et al. (2001) give information on solid waste management in Accra and Kumasi. Their work mainly centered on the type of solid waste that is generated in these two major cities in the country, the amount collected, the landfill sites available and measures taken by the metropolitan Assembly to manage these waste. It was estimated in the study that only 42 percent of the total waste generated daily in Kumasi is actually collected and around 33 percent gets to the landfill site. With finance, it was mentioned in the study that the waste management department is wholly integrated into the KMA budget and less funds are allocated for the management of waste. In Accra, the study revealed that around 60 percent of total waste that was generated in the metropolis was actually collected before the privatization reforms began in 1995, and the rate has since improved to around 70 percent after privatization.

In recent times public-private partnership has been offered as another option for solving the waste management menace in developing countries. Increasingly issues on solid waste management in developing countries have developed around two main concerns; Sustainable development in the urban context, public sector reforms including privatization (Malama et al 2001). In support of public sector reforms, numerous studies have highlighted

deficiencies in public service provision. In Ghana studies conducted into public-private partnership is mainly on Accra and Kumasi.

Frantzen and Post (2001) suggest that "political interference" is behind the failure of public partnership to provide waste management and sanitation services for the poor in Accra and Kumasi, but they went on to argue further that, "community control" of sanitation facilities is perhaps the only way of ensuring greater accountability of service providers to users.

Secondly, the authors of a recent study conducted by the Ghana Water Company, GWC (2000), on the ability of low income areas in the Accra metropolis to pay about 50 percent cost in the construction of household WCs by the world bank urban IV project with the world bank providing the remaining 50 percent revealed that, the low income communities find it difficult to mobilize 50 percent of the cost, which was in the range of 500 000 cedis. This is against the background that average daily income for income dwellers in Accra and for that matter Ghana is 2000 cedis. (GWC, 2000) These articles confirms the fact that low income residents cannot pay for any service rendered in the area of both solid waste and sanitation as Post (1999:201) puts it; "The easiest option for poor residents is to exit or free ride unless charges are heavily subsided".

Obirih-Opareh and Post (2002) touched on the privatization of solid waste management in Accra and Kumasi. They found that though solid waste collection has improved due to competition from the private sector, there has not been a corresponding improvement in environmental conditions in both cities. The study observed that, despite the privatization, the waste management departments of the metropolitan Assemblies were still

responsible for providing all the containers for the central communal containers in both cities. It was also revealed that the KMA still spends 20 percent of its budget on solid waste management, although its cost recovery was only 5 percent of the expenditure. The cost of the city and country waste (CCW), the private waste company contracted in Accra to help manage waste in the city, is ten times the amount the Greater Accra Metropolitan Assembly (GAMA) was spending at the end of the 90s, and represents twice the city total annual "own revenue" collection. The authors concluded that, government policies for solid waste management should solve the financial problems facing city governments, and community participation should also be taken into account to improve sanitation as well as level of the waste collection and management.

Crook (2002) highlight how official policies to encourage more community-based participation in management of waste have impacted on residents in Accra and Kumasi. He, however, mentioned market women, youth associations, residents association, women groups and other interest groups as groups who have to be commended for providing infrastructure such as new clinics, schools and new toilets. With others providing labour to tackle the waste and drainage problems and maintenance of sanitary facilities in the two major cities in the country. It is worth mentioning that most of these associations provide these services in other to derive some benefits from the various Assemblies and the government of the day, the study admits.

Kendie (2002), examines the relationship between socio-cultural and changes in water use and sanitation behaviour on the part of rural population in the upper west and upper east regions of Ghana.

The study touched on waste management methods in these areas of Northern Ghana. The management of waste in these areas was found to be rudimentary. Garbage disposal methods were mainly household dumps, community dumps and disposal on the farms. The study further examined the relationship between settlements and garbage disposal. It was observed that dispersed settlements tended to have more garbage disposed on compound farms as compared to the nucleated settlement areas. Animal excreta, which were used as manure, were also dumped on nearby farms. Waste water management, was found to be appalling as waste water were allowed to flow into pits which becomes stagnant and thus providing breeding grounds for disease vectors. These management practices were sources of concern for the author as the habit of dumping waste on nearby farms is likely to cause an increase in health related diseases due to the proximity of these farms to the homes of these farmers.

A study of other rural areas in the country is likely to reveal similar practices, as waste management services are nonexistent in most rural areas in the country as most of these residents are poor and cannot pay for the services rendered.

Moreover, Post and Obirih-Opareh (2003) also concentrate on the partnership of solid waste collection by the public and private sectors. Their work was an assessment of the partnership between private and public sector in rendering waste management service. The privatization actually benefited the consumers in terms of solid waste collection services frequency and expansion of service areas in Accra. The researchers looked at the impact of solid waste collection on the environmental quality in Accra. They suggested

that the government still lacks accountability in their public services and management.

Boadi and Kuitunen (2003) conducted a study into the urban sanitation situation in Accra. They observed that, middle-income citizens were able to pay for waste collection services whiles residents in low-income households could not. The study also identified major constraints facing the private companies involve in waste collection in the metropolis as financial, lack of workers as well as low morale among the staff. These major problems have played significant roles in the unsatisfactory nature of waste management services in the city. The inability of the low income areas to pay for waste management services has further aggravated the sanitation situation in the city as they have resorted to indiscriminate dumping and burning of refuse which have their own health implications.

Proper management of Assembly's resources is required as waste management can exhaust most if not all of the Assembly's funds and thus leaving the Assembly's coffers empty. A news item in the Ghanaian times of December 23, 2004 reports on how waste management eroded most of the Shama Ahanta Metropolitan Assembly's revenue. The Shama Ahanta Metropolitan Assembly raked in 20.7 billion in revenue in 2004 but sadly, spent a whooping 4.8 billion of the amount on waste management. This amount could have been channelled in providing other important service in the Municipality. Furthermore this confirms the earlier study conducted by Obirih-Opareh and Post (2002) on the privatisation of solid waste management in Accra and Kumasi, where it was found out that the 2 major metropolitan Assembly's in the country, significantly KMA and AMA spends most of their

funds on the management of waste in their various cities. This huge expenditure on waste could have been used in the provision of schools, hospitals, construction of roads and the provision of good drinking water in the Municipality.

Conceptual framework

The literature review has revealed some models for the efficient management of waste in the municipality. Among the various options, contracting for solid waste service holds the greatest promise to developing countries as a way of lowering the cost (Cointreau – Levine, 1994).

Barnekov and Raffel (1990) argues that, by using contracting out approach to garbage collection, a municipality can attempt to take some of the best part of both government and market model of service provision. The municipality accepts its government role as a best provider of public good, but it uses the market approach to keep cost low and service efficient by allowing various garbage collection companies to compete for the cities contract. Such an approach makes it fairly easy for the municipality to expand service as necessary, leaving it to the contracting company to come up with the means to accommodate change. The contractor is restrained from charging prices that are not acceptable to the public because the market place provides the possibility that some other companies can meet the cities needs (Miranda and Anderson, 1994).

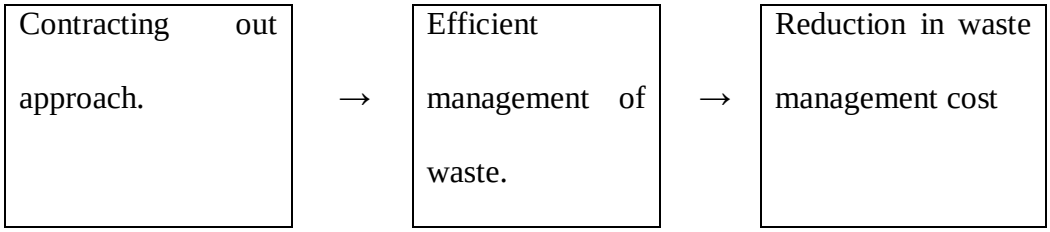

Figure 1: Model for efficient management of waste

Source: Authors construct 2008

Based on economic theory, contracting appears to provide the best solution to the problem of residential solid waste collection because it ostensibly uses the market to keep cost in check while still providing the possible service, it should provide the most cost effective means of service delivery. A municipality contracting out is not forced to use part of its budget to maintain expensive specialised vehicles or larger civil service employee based. Cost savings for both the municipality and citizens should be apparent. (Stein, 1987) Administrators are also spared the difficulty of negotiations with union representatives. If the company that is providing the service is unable to perform, the municipality can reopen the contract for other bids (Mirander and Anderson, 1994).

Contracting out approach will reduce the overdependence on the Assemblies scarce resources for waste management and thus pave the way for effective development of the municipality.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter covers the procedures that were used in the collection of field data for the study. It involves the setting of the study, the sampling procedure, the data collection techniques, data processing and analysis and finally a description of the characteristics of the respondents.

Study area

The Assin North Municipality is among the thirteen (13) districts of the central Region of Ghana and it is one of the 138 Administrative Districts in the country. It lies on Longitudes 1^0 05' East and 1^0 25' West and Latitudes 6^0 05' North and $6^0$40' south. The district covers an area of about 1,500square kilometres and comprises about 1000 settlements including Assin Foso (the district capital), Assin Nyankomasi, and Assin Akonfudi, Assin Bereku, Assin Praso, Assin Kushea and others. The district shares common boundaries with Twifo Hemang Lower Denkyira on the West, Assin South District on the South, Asikuma Odoben – Brakwa and Ajumako Enyan – Esiam on the East, Upper Denkyira on the North – West and Ashanti Region on the North.

Research design

The study is exploratory. Exploratory research is appropriate when there is not enough information available about the research subject. The design was chosen because considering the general objectives of the study; it was the most appropriate design which could lead the researcher to achieve the purpose and to draw a meaniful conclusion from the study with respect to the effect of waste management on the district assemblies' revenue.

Population

The Assin North Municipality could be described as a rural Municipality. The Municipality contains about 500 settlements (Population and housing census, 2000). Most of the major settlements are located along the main Cape–Coast – Kumasi highway in the Municipality. According to the 1984 population and housing census, the population of Assin Municipality was 78,432. The 2000 population and housing census puts the population of the district as 116,349 with an annual growth rate of about 2.9 percent which is a little below the national growth rate of 3.0 percent per annum. Currently the population of the Municipality is estimated to be around 130,000 (2006 population projection). Two settlements in the Municipality could be describes as urban. These are Assin Foso, with a population around 22,837 and Assin Bereku whose population is 5,985. The rest of the settlements may be described as rural with only nine of them having population between 3,762 and 1,809. The rest have population below 1000.

The socio – economic survey conducted revealed that as much as 49.1 percent of the populations are migrants as against 51.9 percent being natives.

As an agrarian economy, the district has as much as 69.4 percent of the labour force employed in the agricultural sector, with most of these farmers being migrants' farmers who have flooded the district due to the fertile lands, which supports the cultivation of diverse food and cash crops.17.7 percent are involved in commerce, with services and industry making up 8.3 and 4.6 percent respectively.

Residents, mainly adults aged eighteen (18) and above constituted the population of the study. Two hundred (200) respondents were chosen from Assin Foso, fifty (50) from Assin Bereku.

Sampling technique

The Assin North Municipality comprises mainly about 500 settlements (population and housing census, 2000). Two settlements in the district could be described as urban. These are Assin Foso, with population around 22,837 and Assin Bereku whose population is 5,985. The rest of the settlements may be described as rural with only nine of them having population between 3,765 and 1,809. The rest have population below 1000.

The waste management Department of Municipal Assembly is responsible for providing waste management service to all areas in the Municipality. It is unfortunate that waste management service in the Municipality is concentrated mainly in the two main towns in the municipality that is Assin Foso and Assin Bereku. In the other settlements, which are mostly rural, waste management services are nonexistent and residents mainly dispose of their waste by burning. The general understanding of the rural sanitation problem in Ghana seems to be that low population concentration

ensures low volumes of waste production (Kendie,2002), Kendie observed that; “it is this kind of thinking that has relegated the rural sanitation problem to the background giving rise to the high incidence of diarrhoea diseases”. (Kendie, 2002:3). It will be very difficult for residents in these rural areas to answer questions regarding some aspects of the research as no waste management services takes place there and as result they could not be in better position to help the researcher.

The research was conducted in the 2 main towns in the municipality i.e. Assin Foso and Assin Bereku. The two main urban centres were selected because majority of the population in the Municipality reside there, and also most of the waste management activities in the municipality concentrated in these towns.

The respondents were chosen by means of proportionate stratified random sampling i.e. the population in the two main towns were stratified into two and a sample was drawn from each stratum and as such the number of respondents from a particular area depended on the size of the population of the area. Based on the population, the ratio of residents in Assin Foso and Assin Bereku was found to be 4:1 thus 200 people were chosen from Assin Foso while 50 people were chosen from Assin Bereku representing the ratio. Residents mainly Adults aged eighteen (18) and above constituted the population of the study. The respondents from the respective areas were chosen by means of simple random sampling.

Purposive sampling was employed to seek the views of four officers connected with waste management in the Municipality. This included the Municipal Finance Officer, the Budget Officer and the head of the waste

management department of the Assembly and the coordinating director of the Municipal Assembly. They were interviewed to find out the amount that was actually spent on waste management and how it has affected the resources of the Municipal assembly. The interviews were conducted during working hours and so all the workers were at post during the interview. The researcher looked at the amount allocated for waste management for a five year period, and how this has impacted on the assembly's resources and development in the municipality.

Sources of data

The research was carried out using data from both secondary and primary sources. Data from the secondary sources include published studies, books, journals and conference papers on the subject. Also information on methods of waste management, existing infrastructure, revenue generation and expenditure, labour force and equipment available was obtained from the Municipal assembly.

Primary data was obtained from social survey undertaken in the Assin North Municipality. The primary data was obtained using instruments such as questionnaire, interview schedules and discussions. The respondents include residents from the rural and urban areas.

Data collection techniques and analysis

The main instrument used for the study was the questionnaire. This was to save time and cost. It was supplemented and complemented by observation of sanitary inspectors and revenue collectors at work.

The administration of the questionnaire was hand delivered by researcher and his four assistants chosen from the study area. The research assistants were chosen and trained to assist the researcher in collecting the data. They were taken through the questionnaire and the interview schedule, interpretation of questions, establishment of good rapport with respondents, neutrality and accurate recording of responses. The questionnaires were administered at the various homes of the respondents.

The questions were both open and close ended. The questionnaire sought information on the occupation of respondents, educational qualification, and attitude towards waste disposal. Specifically, the questionnaire solicited information on bio data, educational background of respondents, perception towards waste disposal, where they deposit their waste, their willingness to pay for waste management services, and availability of toilet facility in their various homes.

The total questionnaires administered were 250. The administration of both questionnaires and interview schedules were done in the evening because most of the respondents were farmers, traders and civil servants and thus were busy during the day. Respondents who could not read nor write or understand English, the interview was done in the local language this gave the researcher the opportunity to explain complex issues to the respondents. The field work lasted for a total of 61 days from 1st June to 31st July 2008.

In addition, interview schedule was used to collect data from staff of the municipal Assembly. The issues covered in the interview included; the income and expenditure of the Assembly, the amount allotted for wasted management and the amount that was actually spent and how waste

management has affected development in the area. The researcher also visited major refuse dumps and communal containers in the municipality to have firsthand information on activities that goes on there.

Ethical consideration

Official permission was sought and objectives of the study made known to the various groups who were to be interviewed before the study was carried out. The Municipal Chief Executive and members of the Municipal Assembly were consulted beforehand, and their consent sought before the study.

Data handling

The researcher ensured that the questionnaire, interview schedules were numbered. Completed questionnaires and interview schedules were collected and crosschecked for inconsistencies at the end of each day of interview. This enabled the researcher to correct any mistake that might have occurred during the study.

Data processing and analysis

The questionnaires and interview schedules received were edited to ensure consistency and were coded for analysis. The Statistical Product and Service Solutions programme was used to analyse the data. Both descriptive and inferential statistics were used in the data analysis. Frequency distribution and percentages were used to analyse the data.

In all 250 respondents were targeted and 242 responded positively. The data were examined for differences or relationships that could be attributed to location of residence, educational level, gender, marital status, level of proper waste disposal and ability to pay for waste management services in the Municipality. The researcher also analysed the effect waste management has had on the Assembly's resources and how development in the municipality has been hampered.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This part deals with presentation and analysis of the data collected. Data collected include background information of the resident's respondents, their perception about waste management in the municipality, how they get rid of their liquid and solid waste, how they are prepared to pay some amount of money in order to fund waste management, how waste management has affected development in the municipality and alternative ways to fund waste management.

Characteristics of the respondents

In this section five main background variables are examined. These are sex, marital status, age, education and occupational types of respondents in the municipality. The rationale for selecting these variables is that they have implication for ascertaining the perception of the respondents towards waste management activities in the municipality and also to find out the level of understanding of the respondents towards questions asked in the questionnaire.

Table 2: Sex distribution of respondents

Sex	Frequency	Percent
Female	138	57.0
Male	104	43.0
Total	242	100.0

Source: Field data, 2008

Table 2, indicates the sex distribution of respondents. It can be observed that over half (57.0%) of the respondents were females with males making up to 43.0% of the respondents. Thus 138 females form the majority of the respondents with 104 males being the minority.

Table 3: Marital status of respondents

Marital status	Frequency	Percent
Married	112	46.3
Living as married	18	7.4
Single and never married	71	29.3
Separated	22	9.1
Divorced	8	3.3
Widowed	11	4.5
Total	242	100

Source : Field data, 2008

From Table 3, about 46.3% of the respondents were married, with 29.3% being single and never married. Nearly about 9.1%, 7.4%,4.5% and 3.3% were separated, living as married, widowed and divorced respectively. This shows that majority of the respondents were married and as such, as it

pertains in the Ghanaian traditional setup can be said to be responsible and therefore their responses could be relied upon.

Age distribution of respondents

The age distribution of residents in the community was determined to know the age groups in the municipality, since in Ghana; it is the youth who are responsible for the daily house chores in the homes.

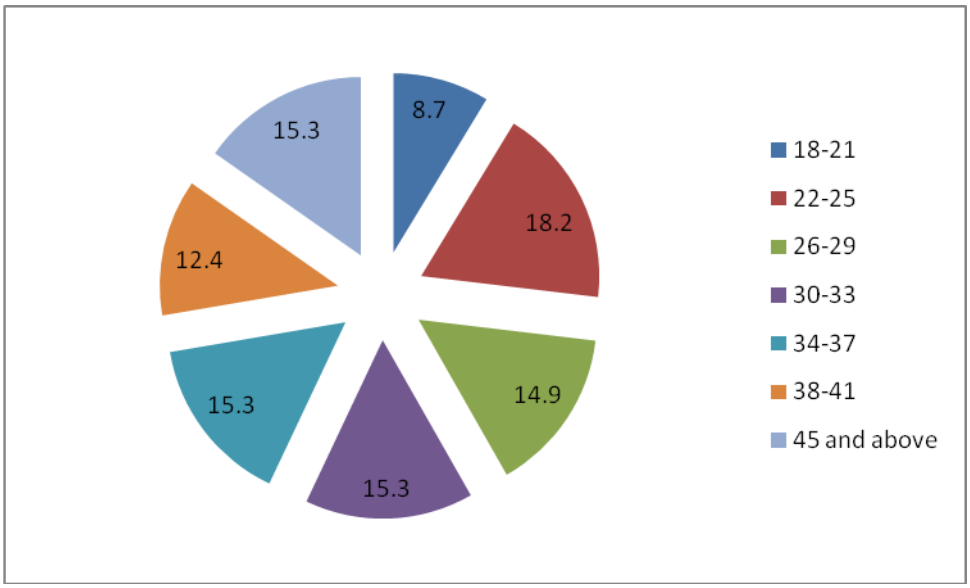

Figure 2: Age distribution of respondents

Source: Field data, 2008

The characteristics of respondents in relation to age as presented in Figure 1 show that, 8.7% were aged between 18 – 21, 18.2% were between the ages of 22 – 25, and also14.9% age fell within the age group of 26 – 29 , while 15.3% had their ages within 30 – 33 age groups.

Also 15.3% and 12.4% of the respondents had their ages within 34 – 37 and 38 – 41 category while, about 15.3% of the respondents were aged 45 and above. The age group with the highest number of respondents were, 22 –

25, 26 – 29, 30 – 33, and 34 – 37. This shows that most of the respondents were the youth. This is very significant because the 2000 population and housing census in Ghana shows that, 46.6% of Ghanaians had their ages within 15 to 64 which represent the highest percentage of people interviewed during the study.

Educational level of respondents

In order to gain a better understanding on general attitude of the respondents towards waste management, their level of educational attainment was assessed as this is important in ascertaining their level of awareness on the benefits of proper waste disposal. Their responses are presented in Table 4.

Table 4: Educational level of respondents

Educational level	Frequency	Percent
No formal education	44	18.2
Basic school	23	9.5
MLSC/JSS	64	26.4
Secondary	60	24.8
Technical/commercial	10	4.1
Tertiary	41	17.0
Total	242	100.0

Source: Field data, 2008

The results on the educational level attained by the respondents revealed that about 26.4% of them had attained MSLC/JSS, 24.8% had been to the secondary school, 17% had have tertiary education. Also about 9.5% and

4.1% have had basic and technical/commercial education respectively; however 18.2% had no formal education at all.

The 18.2% of the respondents with no formal education is alarming since education is seen as a major component for any realistic programme designed to solve environmental problems. This is probably because it has been observed that the abuse of the environment springs from lack of understanding and ignorance.

Besides, environmental studies forms part of the formal school curriculum and it is believed people with formal education would better understand and appreciate the effects of improper waste disposal. Thus they would be willing to contribute either by cash, communal labour and general attitudinal change towards waste generation and its disposal.

Occupational level

Figure 3 describes the occupational distribution of respondent. Occupation of individuals determines their income levels and hence the individual ability to finance waste disposal. That is the ability of the individual to pay for waste disposal should the Assembly decided to impose levy or privatised waste disposal.

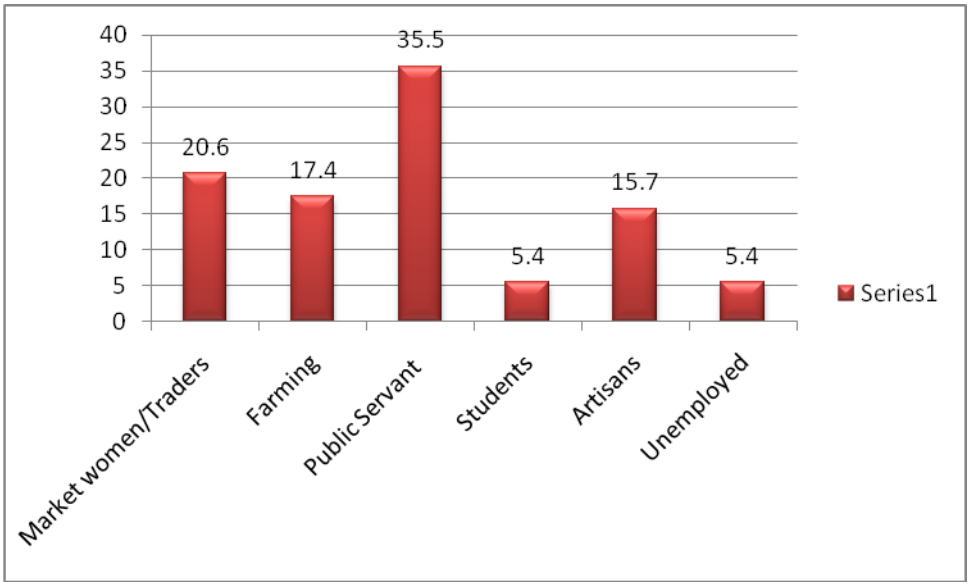

Figure 3: Occupation of respondents

Source: Field data, 2008

In terms of occupation 35.5% of the respondents were public servants, 20.6% were market women/traders and 17.4% were involved in farming. About 15.7% were artisans, while students and the unemployed formed 5.4% each. The ability and willingness to pay for waste collection depends on the ability to pay, as a sizeable number of the respondents are peasant farmers as such falls within the low income bracket, their ability to pay for waste management service will be limited.

Length of stay in the municipality

The length of stay of respondents in the community was examined in order to know the extent to which their responses could be relied upon to be the true reflection of what pertains in the municipality.

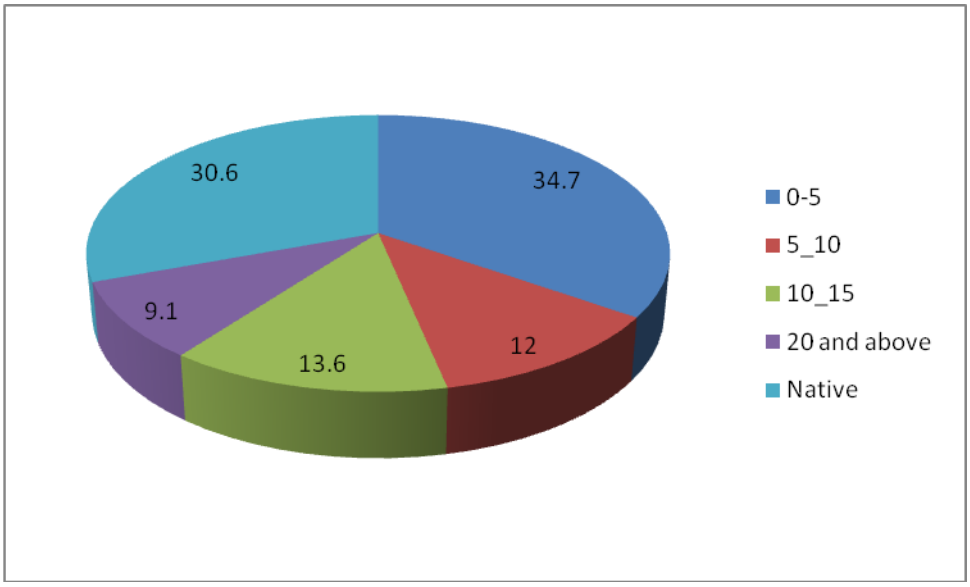

Figure 4: Length of stay in the municipality

Source: Field data, 2008

It can be seen from Figure 4, that a high percentage of respondents have stayed in the municipality for quite a long time and are therefore conversant with the problems associated with waste management practices in the municipality. About 34.7% of the respondents were found to have stayed in the community for a period of at least 5 years, with 12.0% staying for a period of 5 – 10 years. Also 13.6% of the respondents had stayed in the municipality for a period of 10 – 15 years while 30.6% of the respondents were natives. This indicates that respondent's responses can be relied upon.

Waste collection, disposal and management practices in the Assin North municipality

This section deals with waste collection methods, waste disposal and management of waste in the municipality. It also looked at alternative ways to manage waste in the municipality.

Waste disposal methods

What we do with our waste, is an area in waste management that needs much attention, as improper waste disposal has serious environmental and health consequences. Respondent's responses are summarised in Table 5.

Table 5: Waste disposal methods

Disposal method	Frequency	Percent
Dustbins	35	14.5
Refuse collection point	83	34.3
Dumpsite	57	23.6
Burnt	14	5.8
Indiscriminate dumping	51	21.0
Buried	2	0.83
Total	242	100.0

Source: Field data, 2008

Out of the total sample, 14.5% indicated that they dispose off their waste through the dustbins, 34.3% use refuse collection point, 23.6% mentioned dumpsite. Small proportion of the residents ie 5.8% and 0.83% indicated however, that they burn and burry their waste respectively.

Significantly 21.0% of the respondents admitted engaging in indiscriminate dumping; a situation which when not checked could pose serious health implications as it facilitates insect vector breeding. According to the EPA in its annual report for 2002, most of the wastes which are dump indiscriminately in the country ends up in drains, streams and open places. This has created a pressing sanitation problem as many towns and cities are overwhelmed with management of municipal solid and liquid waste (EPA, 2002).

The sex of respondents, marital status, age of respondents and educational levels were cross tabulated with waste disposal methods and the chi square test used to test for any association between them. The marital status of respondents was recategorised from married, living as married, single and never married, separated, divorved and widowed into married and single, educational levels were also recategorised from No formal education, Basic education, MLSC, Secondary Tech/Com, Tertiary into low level of education and high level of education, while age of respondents was recategorised from 18 – 21, 22 – 25, 26 – 29, 30 – 33, 34 – 37 , 38 – 41 and 45 and above into 18 – 26, 27 – 35 and 36 and above. These were cross tabulated with waste disposal methods which has been recategorised from dustbins refuse collection point, dumpsite, burnt, indiscriminate dumping and burried into dustbins, refuse collection points, indiscriminate dumping, burnt and dumpsite. The recategorisation was done because, for each cells, the expected frequency should be more than 5, therefore in order not to violate this condition, the variables were recategorised to ensure that at least, there are 5 elements in each cell.

Table 6: Waste disposal method and sex of respondents

Waste disposal method	Sex		
	Male	Female	Total
Dustbins	16(15.4)	24(17.4)	40 (16.5)
Refuse collection points	38(36.5)	37(26.8)	75(31.0)
Indiscriminate dumping	14(13.5)	40(29.0)	54(22.3)
Burnt	9(8.7)	11(8.0)	20(8.3)
Dumpsite	27(26.0)	26(18.8)	53(21.9)
Total	104(100)	138(100)	242(100)

Source: Field data, 2008

$\chi^2 = 9.767$ P-value = 0.045 $\alpha = 0.05$

The P-value obtained was 0.045 which is less than 0.05 which is less than the level of significance at which the test was run.

The chi-square results showed a significant association between the Gender of respondents and their choice of waste disposal method. From Table 6, 36.5% of the male respondents dispose off their waste through refuse collection points while 26.0% dispose of their waste at the dumpsite. Of the female respondents, 26.8% used refuse collection point, 29.0% indiscriminate dumping and 18.8% dump their wastes at the dumpsite. These results show that Gender of respondents is associated with respondents waste disposal method. ($\chi^2 = 9.767$, P-value = 0.045, $\alpha = 0.05$) the results indicates that, more males uses refuse collection point as compared to females, while more females involve themselves in indiscriminate dumping than males.

The marital status of responds and age were cross tabulated with waste disposal methods and the chi square used to test for any association between the variables and waste disposal methods of the respondents.

The P – value obtained obtained for the analysis was 0.234, which is greater than the level of significance at which the test was conducted.

The chi-square results showed that respondent marital status does not influences their choice of waste management method. Table 7, shows that the preferred method for waste disposal by married couple is refuses collection point (35.4) and Dumpsite (23.1 %). With single respondents, 29.9% used refuse collection point 22.3% involved themselves in indiscriminate dumping whiles 20.5% used the dumpsite.

Table 7: Waste disposal method and marital status of respondents

Waste disposal method	Marital Status		
	Married	Single	Total
Dustbins	16(12.5)	24(21.4)	40 (16.5)
Refuse collection points	46(35.4)	29(25.9)	75(31.0)
Indiscriminate dumping	29(22.3)	25(22.3)	54(22.3)
Burnt	9(6.9)	11(9.8)	20(8.3)
Dumpsite	30(23.1)	23(20.5)	53(21.9)
Total	130(100)	112(100)	242(100)

Source: Field data, 2008

$\chi^2 = 5.556$ P-value = 0.234 $\alpha = 0.05$

The results show that more married couples uses refuse collection point for waste disposal than those who were single. The results reveals that there was no significant relationship between respondents marital status and their waste disposal method ($\chi^2 = 5.556$, P-value = 0.234, $\alpha = 0.05$)

Table 8, presents the cross tabulation of waste disposal methods of respondents and their age. The chi square was conducted at 0.05 significant level and the P – value obtained was 0.064. There is no statistical difference in the waste disposal method of respondents and their age , since the P – value was greater than the alpha value. ($\chi^2 = 14.756$ P-value = 0.064 α = 0.05) About 37.4% of respondents whose age fell within 10-26 used refuse collection point, 23.5% used the dumpsite and 22.4% used the dustbins. Of respondents whose age group fell within 36 and above, 33.3% used refuse collection point, 27.4% indiscriminate dumping and 21.2% dumpsite.

Table 8: Waste disposal method and age of respondents

Waste Disposal Method	Age			
	18 – 26	27 – 35	36 above	Total
Dustbins	23(22.4)	6(22.2)	11(9.7)	40 (16.5)
Refuse collection points	32(31.4)	5(18.2)	38(33.3)	75(31.0)
Indiscriminate dumping	17(16.7)	6(22.2)	31(27.4)	54(22.3)
Burnt	6(5.9)	5(18.5)	9(8.0)	20(8.3)
Dumpsite	7(10.4)	46(26.3)	24(21.2)	53(21.9)
Total	102(100)	27(100)	113(100)	242(100)

Source: Field data, 2008

$\chi^2 = 14.756$ P-value = 0.064 $\alpha = 0.05$

Table 9 presents the cross tabulation of educational level of respondents and waste disposal methods used.

Table 9: Waste disposal method and educational level of respondents

Waste disposal method	Education		
	High level of education	Low level of education	Total
Dustbins	15(22.4)	25(14.3)	40 (16.5)
Refuse collection points	15(22.4)	60(34.3)	75(31.0)
Indiscriminate dumping	23(34.3)	31(11.7)	54(22.3)
Burnt	7(10.4)	13(7.4)	20(8.3)
Dumpsite	7(10.4)	46(26.3)	53(21.9)
Total	67(100)	175(100)	242(100)

Source: Field data, 2008

$\chi^2 = 16.214$ P-value = 0.003 $\alpha = 0.05$

From Table 9, 34.3% of the respondents who have low level of education dispose off their waste through refuse collection point, while 26.3% used the dumpsite and 17.7% through indiscriminate dumping. Majority of the low level education respondents (34.3%) involve themselves in indiscriminate dumping, 22.4% use dustbins and refuse collection point. In Table 9, the chi-square is significant. ($\chi^2 = 16.214$ P-value = 0.003 $\alpha = 0.05$). This means that education and waste disposal method are statistically associated. As the highly educated respondents used refuse collection point, those with low level of education unaware of the dangers associated with improper waste disposal involved themselves in indiscriminate dumping. Opinions of respondents about agencies responsible for refuse collection in the municipality.

When respondents were asked about whose duty it was to collect refuse in the municipality, majority of the respondents agreed to the fact that

the municipal assembly was in charge of refuse collection in the area. Their responses are summarised in the Figure 5.

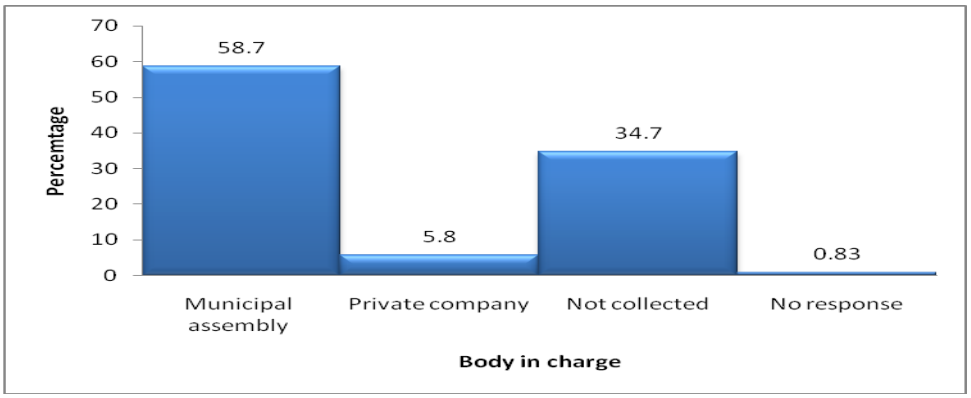

Figure 5: Body responsible for waste disposal

Source: Field data, 2008

From the result, large number of the respondents (58.7%) agreed that it is the responsibility of the Assembly to collect waste (Figure 4). This indicates that majority of the people who generates waste would expect the Assembly to collect them, and thus increasing the work load of the Assembly. The Assembly will therefore have to provide labour, machinery and equipment as well as dumpsite to ensure prompt collection of refuse. The cost of labour, machinery and equipment acquisition and maintenance as well as the cost of a landfill site will go a long way to put stress on the Assembly's revenue.

The result confirms the Assembly's assertion that large chunk of its revenue is spent on waste management as depicted in the financial statement on waste management in Table 24. The opinion of respondents on who should be responsible for waste collection was cross tabulated with marital status, age of respondents, sex of respondents and educational levels.

The chi square test was performed at 95% confidence level. Marital status was recategorised from married, living as married, single and never

married, separated, divorved and widowed into married and single, educational levels were also recategorised from No formal education, Basic education, MLSC, Secondary Tech/Com, Tertiary into low level of education and high level of education, while age of respondents was recategorised from 18 – 21, 22 – 25, 26 – 29, 30 – 33, 34 – 37 , 38 – 41 and 45 and above into 18–26, 27 – 35 and 36 and above.

The chi-square result shows that, there was significant statistical difference in the body responsible for waste disposal and the sex of the respondents ($\chi^2 = 7.469$ P = 0.024 α =0.05). From Table 9, 53.8% of the male respondents were of the view that the municipal Assembly was responsible for waste disposal while 41.3% said their wastes were not collected at all. Also, 60.1% of the females claim the municipal Assembly was responsible with 27.5% indicating that their wastes are not collected at all.

Table 10: Body responsible for waste disposal and sex of respondents

Body responsible for waste disposal	Sex		
	Male	Female	Total
District Assembly	56(53.8)	83(60.1)	139(57.4)
Private Company	5(4.8)	17(12.3)	22(9.1)
Not collected at all	43(41.3)	38(27.5)	81(33.5)
Total	104(100)	138(100)	242(100)

Source: Field data, 2008

$\chi^2 = 7.469$ P = 0.024 $\alpha = 0.05$

The results indicates that the sex of respondents influence their choice of the body responsible for waste disposal. The P – value obtained was 0.024

which is less than 0.05 the level of significance at which the test was conducted. Both males and females were of the view that the municipal assembly was responsible for waste disposal.

The marital status of respondents and their age were cross tabulated with body responsible for waste disposal and the chi square used to test for any association between them.

Table 11: Body responsible for waste Disposal and Marital status of respondents

Body responsible for waste disposal	Married	Single	Total
District Assembly	71(55.6)	68(60.7)	139(57.4)
Private Company	13(10.0)	9(8.0)	22(9.1)
Not collected at all	46(35.4)	35(31.3)	81(33.5)
Total	130(100)	112(100)	242(100)

Source: Field data, 2008

$\chi^2 = 0.952$ P = 0.621 $\alpha = 0.05$

From Table 11, 54.6% of the married respondents claims the Municipal Assembly is responsible for waste disposal while 35.4% said that their wastes are not collected at all. About 60.7%of the single respondents were of the view that the Municipal Assembly was responsible for waste management with 31.3% of the respondents claiming that their wastes are not collected at all. It is interesting to not that a sizeable number of the respondents were of the view that their waste are not collected at all and as such the Assembly needs to do more to collect all wastes in the Municipality.

The P – value obtained (0.621) is greater than the level of significance (0.05). The results show that there was no significant relationship between marital status and body responsible for waste disposal.($\chi^2 = 0.952$, P = 0.621, α = 0.05) this shows that respondents marital status does not influence their opinion on body responsible for waste disposal in the municipality.

Table 12: Body responsible for waste disposal and age of respondents

Body responsible	Age			
	18 – 26	27 – 35	36 above	Total
District Assembly	69(67.6)	14(51.9)	6(49.6)	139(57.4)
Private Company	5(4.9)	6(22.2)	11(9.7)	22(9.1)
Not collected at all	28(27.5)	7(25.9)	46(40.7)	81(33.5)
Total	102(100)	27(100)	113 (100)	242(100)

Source: Field data, 2008

$\chi^2 = 13.693$ P - value 0.008 $\alpha = 0.05$

There was a significant relationship between the body responsible for waste management and the age of respondents as the P – value (0.008) obtained is less than the level of significance (0.05).

From Table 12, 67.7% of respondents whose age fell within the age group of 18-26 said it was the Assembly which was responsible for waste disposal while 27.5% said their waste are not collected at all. Of the respondents whose age group fell within 36 and above, 49.6% said it was the Assembly and 40.7% said waste is not collected at all. The result shows that waste disposal and age are related.

Table 13, presents the cross tabulation of educational level of respondents and their opinion on body responsible for waste disposal.

Table 13: Body responsible for waste disposal and educational level of respondents

Body responsible	Education		
	High level	low level	Total
District Assembly	35(52.2)	104(59.4)	139(57.4)
Private Company	5(7.5)	17(9.7)	22(9.1)
Not collected at all	27(40.3)	54(31.3)	81(33.5)
Total	67(100)	175(100)	242(100)

Source: Field data, 2008

$\chi^2 = 1.997$ P - value 0.369 $\alpha = 0.05$

The P – value(0.369) obtained was greater than the level of signifance (0.05). The chi – square results indicates that, there is no statistical difference between body responsible for waste disposal and education of respondents.

From Table 13, 59.4% of the respondents with low level of education were of the view that the District Assembly was responsible for waste disposal while 30.9% claims their waste are not collected at all. Also 52.2% of respondents with high level of education said the Assembly was responsible and 40.3% said their wastes were not collected. This result however, was not statistically significant.

How often are refuse containers emptied

Proper waste collection requires efficient service delivery in collecting, loading and transporting waste to the final disposal site. Responses on how often refuse containers are emptied is summarised in Figure 6.

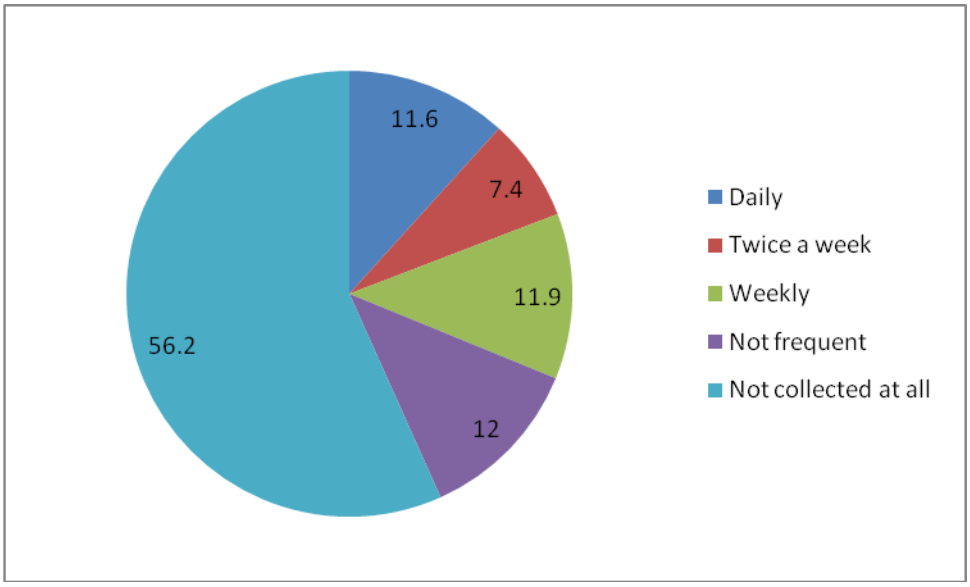

Figure 6: How often refuse containers are emptied

Source: Field data, 2008

As observed from Figure 6, most part of the municipality does not have the container service at all and as a result a high number of the respondents (56.2%) said that their waste is not collected at all. It was however found out that, the rate of emptying of containers was on the regular basis in most part of Foso especially in the residential areas as compared to other areas. In Assin Bereku, the frequency of refuse collection was not regular. This may be due to the fact that Assin Foso is the Municipal capital.

How frequent containers are emptied is very important, since none emptying of refuse containers will result in fouling the air in the area in which it is

situated. It will also pose as a threat to public health and attract insects and pests.

This can result in indiscriminate dumping of refuse by most residents in the municipality and thus causing public nuisance. The assembly will be required to clear the mess that has been cause by the indiscriminate dumping and thus resulting in the Assembly using more money in the management of waste.

Opinions of respondents on importance of waste disposal

Respondent's perception on the importance of waste management was assessed as this is relevant in determining the attitude of respondents towards waste management in the municipality. Their responses are indicated in Figure 7.

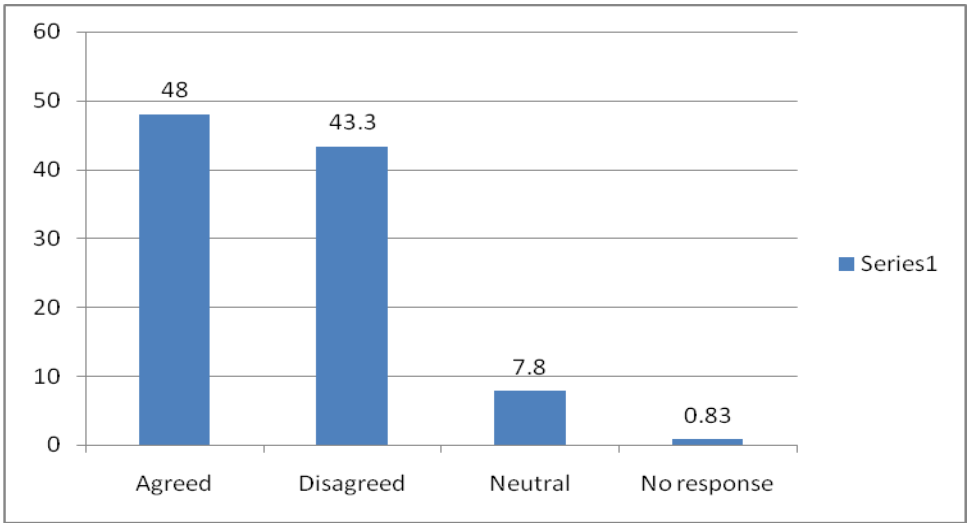

Figure 7: Opinions of respondents on importance of waste disposal

Source: Field data, 2008

The conclusion that can be drawn from Figure 7, is that about 48% of the respondents in the municipality believed that waste disposal is important

and thus should be taken seriously while 43.3% disagree with the fact that waste disposal is important. This result clearly indicates that there is a low environmental awareness in the municipality; the Assembly needs to intensify awareness creation and education as they are important in changing attitudes towards proper waste disposal, for improved waste management services.

Low environmental concern may be attributed to the low level of environmental education and limited number of community organisation with an interest in the environment (Mensah, 1997). The inability of the respondents to appreciate the importance of waste management might stem from the fact that most of them were illiterates and did not receive any formal education on the environment. In addition, education by the Environmental Protection Agency (EPA) might not be adequate hence the inability of the respondents not appreciating the importance of managing waste despite its hazardous effect on human life.

The importance of waste management was cross tabulated with marital status, age of respondents, sex of respondents and educational level. Marital status was recategorised from married, living as married, single and never married, separated, divorved and widowed into married and single, educational levels were also recategorised from No formal education, Basic education, MLSC, Secondary Tech/Com, Tertiary into low level of education and high level of education, while age of respondents was recategorised from 18 – 21, 22 – 25, 26 – 29, 30 – 33, 34 – 37 , 38 – 41 and 45 and above into 18 – 26, 27 – 35 and 36 and above. Chi square test was performed to investigate any association. The results are shown in Tables 14, 15, 16 and 17.

Table: 14: Importance of waste management and sex of respondents

Importance of waste management	Sex		
	Female	Male	Total
Agree	69(50.0)	44(42.3)	113(46.7)
Disagree	56(40.6)	47(45.2)	103(43.4)
Neutral	13(12.5)	13(9.4)	26(10.7)
Total	138(100)	104(100)	242(100.0)

Source: Field data, 2008

$\chi^2 = 1.572$ P = 0.456 $\alpha = 0.05$

The results for Table 14 shows observed differences in the way males and females view the importance of waste management. More females (50.0%) than males (42.3%) agree that waste management is important, while more males (45.2%) than females (40.6) disagree that waste management is important. However, these differences are not statistically significant (X^2= 1.572 P – Value = 0.456, $\alpha = 0.05$.

Marital status of respondents, and their age were cross tabulated with the importance of waste management. The chi square test was performed to investigate any association between marital status and importance of waste management.

Table 15: Importance of waste management and marital status of respondents

Importance of waste management	Marital Status		
	Married	Single	Total
Agree	6(51.5)	46(41.1)	113(46.7)
Disagree	55(42.3)	48(42.9)	103(42.6)
Neutral	8(6.2)	18(16.9)	26(10.7)
Total	130(100)	112(100)	242(100.0)

Source: Field data, 2008

$\chi^2 = 6.924$ $\alpha = 0.05$ $P = 0.031$

The P – value (0.031) obtained is less than than the level of confidence (0.05). The chi square test showed a significant statistical difference between the importance of waste management and marital status. From Table 3, 51.5% of the married respondents agreed that waste management is important while 42.3% disagreed. About 6.2% of the married respondents were neutral. Also 41.1% of the single respondents agreed to the importance of waste management while 42.9 disagreed. This showed that married respondents were aware of the importance of waste management and thus agreed to its importance in the municipality.

Table: 16: Importance of waste Disposal and Age of respondents

Importance of Waste Disposal	Age			
	18 – 26	27 – 35	36 above	Total
Agree	44(43.1)	12(44.4)	57(50.4)	113(46.7)
Disagree	44(43.1)	10(37.0)	44(43.4)	103(43.4)
Neutral	14(13.7)	5(18.5)	7(6.2)	26(10.7)
Total	102(100)	27(100)	113(100)	242(100)

Source: Field data, 2008

$\chi^2 = 5.404$ P = 0.248 $\alpha = 0.05$

From Table 16, 43.1% of respondents whose age group fell within 18-26 both agree and disagreed to the importance of waste management. About 50.4% of respondents whose age group fell within 36 and above agreed to the importance of waste management while 42.4% disagreed. The result however is not statistically significant.

($\chi^2 = 5.404$ P = 0.248 $\alpha = 0.05$) Therefore there is no relationship between importance of waste disposal and age of respondents.

The categories of importance of waste management and educational level were cross tabulated and the chi square test performed to investigate any association. Table 17 gives the cross tabulation of the relationship.

Table: 17: Importance of waste disposal and education level of respondents

Importance of waste management	Education		
	High level	Low level	Total
Agree	29(43.3)	84(48.0)	113(46.7)
Disagree	30(44.8)	73(41.7)	103(43.4)
Neutral	8(11.9)	18(10.3)	26(10.7)
Total	67(100)	175(100)	242(100)

Source: Field data, 2008

$\chi^2 = 0.461$ P = 0.744 $\alpha = 0.05$

From Table 17, the P – value(0.744) obtained is greater than the level of confidence(0.05), this indicates that importance of waste disposal and education of respondents are not related, since the chi – square result is not significant.

From Table 17, 48.0% of the respondents with low level of education agreed that waste management is important, while 41.7% disagreed. About 44.8% of the respondents with high level of education disagreed that waste management is important and 43.3% agreed. These results however are not statistically significant ($\chi^2 = 0.461$ P = 0.744 $\alpha = 0.05$

Level of satisfaction with waste management services

In order to find out the prevalence of waste management services in the municipality, satisfaction levels of waste management services in the municipality was assessed. The results are tabulated in Table 18. The results show that, majority of the respondents (60.7%) is satisfied with waste

management services in the municipality. Uncollected waste in the municipality, non sweeping of public places, none emptying of refuse containers and inadequate sanitary equipments are some of the main reasons respondents gave as the cause of their dissatisfaction with the services provided.

Table 18: Level of satisfaction with waste management services

Level of satisfaction	Frequency	Percent
Satisfactory	147	60.7
Unsatisfactory	95	39.3
Total	242	100.0

Source: Field data, 2008

Despite the Assembly's effort to manage waste by providing labour, machinery and equipments, large number of residents (39.3%) were not satisfied with the Assembly's waste management services. Respondents in the municipal capital Assin Foso were not happy with services rendered by the assembly; they claim the services were poor, though some admitted that the assembly is doing it best. Residents in Assin Bereku; were however of the opinion that the Assembly could do better. The implication is that the Assembly has to intensify its effort by providing labour, equipment and machinery; hence additional funding is necessary, as a result putting pressure on the scarce Assembly's resources.

The sex of respondents , marital status, age of respondents and educational levels were crosstabulated with satisfaction levels and the chi square test used to test for any association between them. The marital status

of respondents was recategorised from married, living as married, single and never married, separated, divorved and widowed into married and single, educational levels were also recategorised from No formal education, Basic education, MLSC, Secondary Tech/Com, Tertiary into low level of education and high level of education, while age of respondents was recategorised from 18 – 21, 22 – 25, 26 – 29, 30 – 33, 34 – 37 , 38 – 41 and 45 and above into 18 – 26, 27 – 35 and 36 and above. These were crosstabulated with satisfaction levels and the results are presented in Table 19, 20, 21 and 22.

Table 19: Satisfaction levels and sex of respondents

Satisfaction Level	Sex		
	Male	Female	Total
Satisfactory	56(53.8)	91(65.9)	147(60.7)
Unsatisfactory	48(46.2)	47(34.1)	95(39.3)
Total	104(100.0)	138(100.0)	242(100.0)

Source: Field data, 2008

χ^2 = P-value 0.056 $\alpha = 0.05$

In Table 19, P – value (0.056) is greater than the level of significance (0.05). This indicates that satisfaction levels and sex are statistically not related. From Table 18, more females (65.9%) were more satisfied than males in the waste management activities in the municipality.

Marital status of respondents and their age were cross tabulated with the importance of waste management. The chi square test was performed to find out if there is any association between marital status and satisfaction level

of respondents. Table 20 and 21 presents the cross tabulation and the chi square values obtained.

Table 20: Satisfaction levels and marital status of respondents

Satisfaction Levels	Marital Status		
	Married	Single	Total
Satisfactory	84(64.6)	63(56.3)	148(61.2)
Unsatisfactory	46(35.4)	49(45.2)	94(38.8)
Total	130(100)	112(100)	242(100)

Source: Field data, 2008

$\chi^2 = 1.766$ $P = 0.184$ $\alpha = 0.05$

From Table 19, 64.6% of the married respondents were satisfied with waste management activities whiles 35.4% were not satisfied. Of the single respondents, 56.3% were satisfied while 43.8% were not satisfied. These results however are not statistically significant since the P – value (0.184) obtained is greater than the level of significance (0.05).

Table 21: Satisfaction levels and age of respondents

Satisfaction Levels	Age			
	18 – 26	27 – 35	36 above	Total
Satisfactory	67(65.6)	15(55.6)	65(57.5)	147(60.7)
Unsatisfactory	35(34.3)	12(44.4)	48(42.5)	95(39.3)
Total	102(100)	27(100)	113(100)	242(100)

Source: Field data, 2008

$\chi^2 = 1.842$, P-value 0.348 $\alpha = 0.05$

From the chi – square results, the P – value obtained is 0.348 which is greater than the level of confidence (0.05). this shows that age of respondents has no influence on their satisfaction levels

The categories of satisfaction levels and education were cross tabulated and chi square test performed to investigate any association. Table 21 gives the cross tabulation of the relationship.

Table 22: Satisfaction levels and educational level of respondents

Satisfaction Levels	Education		
	High level	low level	Total
Satisfactory	31(46.3)	116(66.3)	147(60.7)
Unsatisfactory	36(53.7)	59(33.7)	95(39.3)
Total	67(100)	175(100)	242(100)

Source: Field data, 2008

$\chi^2 = 8.141$, P-value 0.004 $\alpha = 0.05$

From Table 22, 66.3% of the respondents with low level of education were satisfied with waste management activities in the municipality and 33.7% were not satisfied. Of the respondents with high level of education 53.7% were not satisfied with 46.3% satisfied.

From the chi – square, the P – value (0.004) is less than the level of significance. This shows that there is a significant difference between satisfaction levels and education of respondents and therefore respondents' education and satisfaction levels are associated.

The more educated respondents are the less satisfied they were with waste management activities and the less educated they were the more satisfied they are. This clearly indicates that the highly educated respondents knowing the dangers associated with improper waste disposal demands more from the municipal assembly.

Waste management and its effect on development in the Assin North municipality

The effects of improper waste disposal are enormous and go beyond health and environmental problems. However, there are other equally important competing interest such as education, health, employment, infrastructure development, good drinking water provision and others, which need to be attended to by the Municipal authorities and the government. This calls for judicious use of resources in order not to stifle other areas of the needed funds so as to improve upon the living conditions of the populace.

Perceptions of the respondents were solicited on whether they think huge sums of money are used in financing waste management, about 69.4% of the respondents agreed with the fact that huge sums of money were used to finance waste. When respondents were further asked to explain how they got to know, about 21.0% of the respondents cited the payment of workers salaries as the cause, also 7.1% and 3.5% indicated; maintenance of large fleet of vehicles an acquisition of landfill site and purchase of sanitary equipments as contributing to the high expenditure on waste.

Assin North Municipal Assembly's expenditure on waste for the year 2007

The perception by respondents that the Assembly's spend huge sums of money on waste management was confirmed by an interview with the Staff of the Municipal Assembly. These staff includes the Municipal finance officer, the Municipal budget officer and the Head of the environmental Health division of the Assembly. It was found out during the interview that waste management was a huge burden on the Assemblies budget. This is because operations involved in waste management that is payment of salaries or wages of staff, operation and maintenance, repair of equipments and facilities, fuel and others require funds. This information is contained in Table 22.

Table 23: Expenditure on waste management for 2007

Item	Amount spent GH¢
Salary for workers	2, 190.00
Logistic acquisition	5,000.00
Maintenance of vehicle and fuel	17, 000.00
Landfill site purchase	3,000.00
Total	21,190.00

Field data, 2008

The Waste Management Department of the Assin North Municipal Assembly had 28 workers as its work force. These include both casual and permanent workers. Each casual worker receives thirty Ghana cedis daily (GH¢ 30.00) while each salary worker is paid one hundred and five Ghana cedis (GH¢105.00) a month. Acquisition of logistics for effective waste

disposal costs the Assembly five thousand Ghana cedis (GH¢5,000.00) in 2007, while maintenance of vehicles and fuel amounted to seventeen thousand Ghana cedis (GH¢17,000.00) in 2007. The purchase of a landfill site for final disposal of refuse cost the Assembly three thousand Ghana cedis (GH¢3,000.00). When these amounts were compared with the yearly allocation for waste management which is suppose to be about 5% of the total Assembly's expenditure, an increase of 3% was realised. This is very significant as the amount spend on education, health, infrastructure development was very low, waste management services exceeded the amount budgeted for in the fiscal year. This was not an isolated case; amount spent on waste management increased for five consecutive years i.e. from 2003 to 2007. As depicted in Table 6 reproduced below. As shown in the table below, the yearly allocation for waste management always increases every year.

Since the scarce resources of the Assembly have to be used to manage waste, some developmental programs and projects planned by the Assembly have stalled over the years. Among some of these projects were education and health where the Assembly could not meet its target of extending school and health post to some locations in the Municipality. This shows clearly that , the cost of waste management is very high and other means of funding should be found to reduce the effect it has on the Assembly's budget and consequently on the Assembly's development.

Table 24: Financial statement on waste management of the Assin North Municipal Assembly

Year	Common fund (¢)	Internally generated fund (¢)	Budget on waste management (¢)	Expenditure on waste management		
				Common fund (¢)	Internally generated fund (¢)	Total (¢)
2003	5.311 billion	40 million	60,000,000	72,350,400	618000	72,968,400
2004	5.020 billion	40 million	70,000,000	86,250,000	4,935,000	91,185,000
2005	5.204 billion	50 million	100,000,000	162,532,000	4,610,000	167,142,000
2006	5.536 billion	60 million	110,000,000	178,687,243	4,391,000	183,078,243
2007	7.531 billion	1.2 billion	250,000,000	252,903,783	9,190,020	262,093,803

Source: Assin North Municipal Assembly, 2007

Respondent's perception on whether waste management has affected development.

On whether waste management has affected development, 62.4% of the respondents agreed with the fact that waste management has affected development, while 37.6% of respondents disagree with this. This indicates that majority of residents accept the fact that many developmental projects have stalled as a result of huge sums of money being channelled into the management of waste.

Sources of funding

Funding of waste management in the Assin North Municipality is from two main sources that is the internal and external sources. The internal source is mainly obtained from monies accruing from charges instituted by the Municipal coordinating council in the Municipality over the years. These includes; market tolls, bridge tolls, property rates, transport tolls, services rendered to institutions by the staff of the waste management department of the Assembly, sanitary offenders and amount charged on stray animals.

The external fund are typically grants and loans from central governments, non governmental organisations (NGOs), private organisations, donor agencies and environmental organisations. The common fund is a grant which is a special financial assistance from the central government to the District/Municipal/Metropolitan Assemblies. These grants normally comes every quarter in the year and is intended for many purposes. Significantly the common fund is to complement the internally generated fund of the Assemblies in order for them to undertake development projects. Though the

common fund is expected to complement the internally generated fund, it has become the financial backbone of the Assin North Municipal Assembly due to the low revenue mobilisation recorded by the Assembly every year. The Assin North Municipal Assembly relies greatly on the common fund for its waste management activities as the capital cost involve is very huge and cannot be sustain solely, by the internally generated revenue.

Alternative means to finance waste management

Respondent's opinion was sought on the various ways to finance waste management, in order to reduce the financial burden on the Municipal Assembly. The result is summarised in Figure 8.

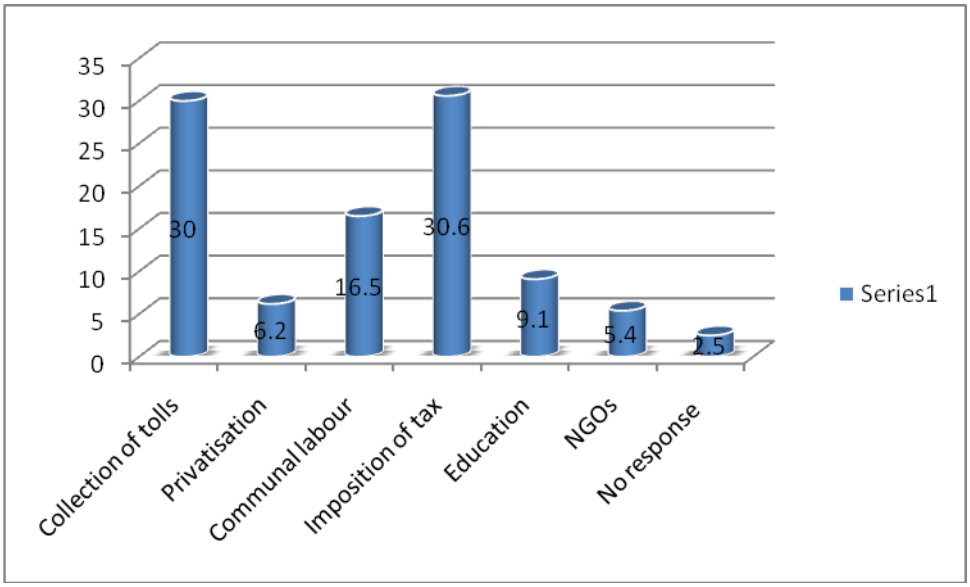

Figure 8: Alternative means to finance waste management

Source: Field data, 2008

As the municipal Assembly continues to fund waste management, the cost to the municipality continues to go up .This calls for a search for alternative

sources of funding. Respondents suggested a number of ways to fund waste management in the municipality. This includes collection of tolls (30%), privatization (6.2%), offering of communal labour (16.5%) and imposition of taxes (30%).

As waste collection require the appropriate equipments for collecting, loading and transporting the waste to the final disposal site. Respondents were asked whether they are prepared to contribute some amount of money for the purchase of sanitary equipments, about 75.2% of the respondents agreed. Some residents were of the view that waste management was the sole responsibility of the Assembly, and therefore were not willing to contribute anything at all.

Majority of the respondents were willing to involve themselves in communal labour to rid the municipality of filth. About 90.6% were ready to involve themselves in communal labour. This shows that the communal spirit which was common with Ghanaians in the past is still there and can be harnessed to rid the municipality of filth and thus reduce the expenditure on waste management. This findings confirmed the study conducted by Crook (2002), on public private partnership in service delivery of waste management services in Accra and Kumasi; “Market women, youth associations, residents associations, women groups and other interest groups came together in the 1990s to provide infrastructure such as toilet, clinics, schools and new toilets with others providing labour to tackle waste, drainage problems and maintenance of sanitary facilities in the two cities”.

It heart warming to note that majority of the respondents(90.6%) are willing to involve themselves in communal labour; the Assembly can therefore

embark on clean up exercises and other environmental activities to rid the municipality of increasing filth, this will go a long way to reduce the amount of money spent on waste management.

Hour's respondents are willing to spend every week in communal labour

Hour's respondents are wiling to spend every week to undertake communal labour in the municipality was determined as this will show their level of commitment in this area of waste management. Their responses are contained in Figure 9.

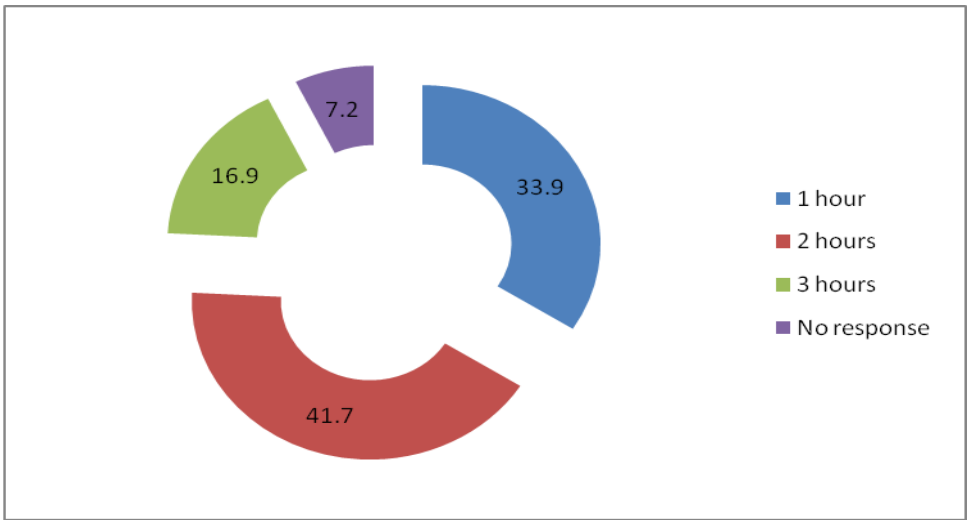

Figure 9: Hour's respondents are willing to spend every week in communal labour

Source: Field data, 2008

From Figure 9, it is revealed that majority of the respondents are willing to spend some time in communal labour, every week to rid the municipality of filth. About 33.9% and 41.7% of the respondents were willing

to spend 1 and 2 hours respectively every week, whereas 16.9% were ready to spend 3 hours for communal labour every week.

Due to the scarce resources of the Assembly which is not enough to manage waste in the municipality, respondents were asked if they want private companies to be involved in refuse collection in the Municipality. Majority of the respondents (71.3%), agreed. The high percentage of the respondents, willing to allow private involvement can be attributed to the public servants in the municipality, who due to higher education are fully aware of the benefits of proper waste disposal.

Willingness to pay for waste management services

One feature of the questionnaire was "willingness to pay" (WTP) for waste collection service so as to find out the best way to manage waste in the municipality. The result is shown in Table 24.

Table 25: Willingness to pay for waste management services

Willingness to pay	Frequency	Percent
Yes	128	52.9
No	71	29.3
No response	43	17.8
Total	242	100.0

Source: Field data, 2008

It is quite obvious from the table that majority of the respondents (52.9%) are willing to accept private sector involvement and are also willing to pay for the cost. The findings confirmed the report made by Boadi and

Kuitunen (2003) in their study on the urban sanitation situation in Accra; "middle- income citizens were able to pay for waste collection services while residents in low-income households could not pay".

The assembly should cut down expenditure on waste management by contracting it out to private companies. The Municipal Assembly will then be able to embark on its agenda of developing the various communities in the Municipality. The no response may be attributed to residents who do not care about the final disposal of waste and thus feel that there is no need to participate in waste management services.

Human excreta disposal

Proper disposal of human waste is an important aspect of waste management which needs all the attention of the Assembly. In order to obtain an overall picture of the type of toilet facilities and its prevalence rate in the municipality respondents were interviewed on the availability of toilet facility in each home.

Types of toilet facility

The availability of toilet facility in a municipality is vital for the effective development of the municipality. Respondents were asked on the type of toilet facility they use in their homes. The research found out that majority of the respondents do not have toilet facility in their various homes, their responses are indicated in Figure 10.

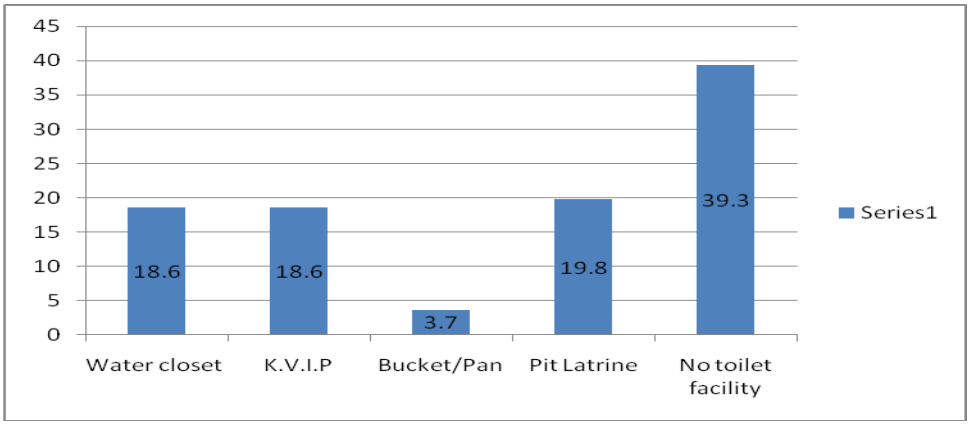

Figure 10: Types of toilet facility

Source: Field data, 2008

Figure 10 show that the majority of the respondents in the community had no toilet facility in their homes. As much as 39.3% of the respondents do not have toilet facility in their homes. Most of these respondents use the public toilet and also the bush. As revealed in the table, 18.6% of the respondent's uses water closet, 18.6% K.V.I.P., 3.7% uses Bucket/Pan and 19.8% uses pit latrines. The unavailability of toilet facility in most homes in the municipality is not peculiar to the Assin North Municipal Assembly alone, Devas and Korboe (2000), in their study on city governance and poverty in Kumasi revealed that, about 40 percent of residents in Kumasi depend on public toilets. This means that the government and the various Assemblies should make the provision of toilet facility to communities in the country its highest priority, as their unavailability poses a great health risk to residents in the country.

Improper disposal of human waste through open defecation is going to cause the breeding of flies and other vector of diseases which will spread diseases in the community. The overdependence on the public toilet is also

likely to increase the frequency at which septic tankers are to be engaged to evacuate these wastes away and thus increase the financial burdens on the municipal assembly.

Waste management situation in the Assin North municipality

Most Assemblies have embarked on several programmes in the past aimed at reducing waste in the various municipalities, however little or no significant gains have been made at all as heaps of waste continues to overwhelmed many communities in the country.

In the Assin North municipality, waste is generated from various sources. The types and quantities of the waste generated depend mainly on the socio – economic status, culture and productive activity of the individual and the household concerned. The main types of waste in the municipality are domestic waste, commercial and institutional waste and biomedical waste. Domestic waste are made up of food waste from the kitchen, rubber and plastics, paper, scrap metal, rubbish, ashes, animal waste and human excreta. Commercial and institutional wastes are waste from hotels, schools, markets, offices and other public places. The waste generated from these places is normally solid and liquid in nature, with plastics and polythene making the greater part of it. Biomedical waste from health institutions is also generated by some health institutions in the district.

There are no major industries in the Assin North municipality and therefore industrial and construction waste is some how not a major problem. However, small saw mills and fitting shops scattered in some parts of the communities especially at the municipal capital ,Assin Foso poses a great

threat to the environment and residents. Methods used to collect waste in the municipality include, bin collection point, sweeping of public places, sweeping of markets and lorry parks and also drainage of major gutters in the municipality. There is no door to door waste collection; the predominant waste collection method used is the central communal system which involves the one step collection where residents throw their waste in the bins allocated at the various points in the community.

The Assin North Municipality churns averagely, 28,000 metric tons of solid waste annually. Out of this waste about 60% is collected and disposed of with the rest left at the mercy of the weather. Majority of the solid waste is made up of plant remains/wood, rubber/plastics, paper, scrap metal and animal faeces. The volume of the liquid waste generated was assessed to be about 10,000 gallons daily. A pilot scheme has just been introduced to find the generation rate of both liquid and solid waste. Cesspool emptier from sister districts collect fifty Ghana cedis (GH¢ 50.00) to dispose of all liquid waste in the municipality. These wastes are treated with disinfectants before they are sent to the final disposal sites for proper disposal and this is done on daily basis. Health institutions in the municipality with the help of the waste management department of the Assembly treats and gets rid of their biomedical waste in a safe manner.

Communities which do not have access to waste management activities have designated refuse sites created by the communities, these refuse sites are attended to by members of the community themselves, this is done weekly or monthly by raking or by burning. Only a small proportion of inhabitants in the

municipality have internal toilets facilities such as K.V.I.P.s and pit latrines which are well managed by the communities.

Authorities responsible for waste management in the Assin North Municipality have fallen short of providing satisfactory services to both the urban and rural areas. Among the common weakness in existing services provided are untrained staff, poor pay scales, poor operation and maintenance of service facilities and above all a lack of civic awareness on the part of a section of the residents. In most households carrying of waste to communal containers are done by children who disposed of the waste at places convenient to their bellies, this makes work of the sanitary labourers very difficult. Funding continues to be a major problem in the municipality and thus other areas must be found in other to dispose of waste with less financial problems.

Revenue generation activities by the municipal assembly

The decentralisation reform which was embarked upon in 1989 by the government of Ghana transferred many powers from the central government to the metropolitan/municipal and district Assemblies. Among such powers was the one as contained in section 10(3) of the 1993 local government Act (Act 462). This states that the Assembly should, formulate and execute plans, programmes and strategise for the effective mobilisation of the resources necessary for the overall development of the district. In other words, the Assembly has been mandated to raise levies, impose fines, rates, taxes and charge fees so as to improve upon the basic infrastructure and also to provide

the necessary service in the area of sanitation and waste management and for the overall development of the Municipality.

There are two main sources of revenue for the Assembly – internal and external. The Assembly generates its internal revenue mainly from Rates, Fines and Fees, Licenses, Rent, Investment and others. The municipal Assembly charges rates on properties in the Municipality. These properties include building, stores, bars private firms and commercial entities. Fees are also obtained from market women who sells their wares in the market, with this tickets are issued during market days through which monies are collected for the Assembly. Stray animals and sanitary offenders are also a source of revenue for the Assembly, the Assembly charges ten Ghana cedis (GH¢ 10.00) on every stray animal found loitering around in the community at odd times, sanitary offenders are normally sent to court for the necessary fines to be imposed.

Major establishments like filling stations, industries, hotels needs to acquire a license from the municipal Assembly, prior to their establishment in the municipality, this fetches the Assembly some revenue. Public toilets, waste collection and other services rendered by the personnel of the waste management department of the Assembly to some individuals and institutions also give the Assembly some revenue. In Foso it cost five Ghana pesewa (5GP) per visit to a public toilet. According to the Municipal Finance Officer, though charges exist for the disposal of waste, only some institutions and few individuals pay for such services.

The Assembly has invested in the building of market stores, recreational centres and public meeting places in various part of the

municipality over the years, the Assembly charges rent on each of these facilities when they are hired , the proceeds are used in the development and provision of services in the various communities in the communities. The Assembly gets its external revenue mainly from the District Assembly's Common Fund (DACF), grants from sister – cities, UN Habitat, World Bank and other development partners. The district Assembly's common fund, popularly called common fund was created by an act of parliament (Act 455 of 1993).

The district Assembly's common fund is a pool of resources- 5% of nationally generated revenue set aside to be shared among all the 138 Metropolitan/Municipal/District Assemblies. The common fund was established to encourage local governance and to deepen Government commitment to decentralisation. It was also created to complement the internally generated fund of the various Assemblies in order for them to be able to undertake development projects and provide other services.

The World Bank and other major donors like, UN Habitat, the Germans, British, Dutch and the Danes have contributed in no small way to the revenue needs of the Assembly by providing and also sponsoring various programmes in the communities.

Due to the widespread poverty in Assin North Municipality, and consequent low financial capacity of the residents, people are neither able nor prepared to live up to their tax obligations. As a result many activities including waste management continues to be a heavy burden on the overall Municipal budget. While it is anticipated that revenue collection among ordinary citizens will be difficult, it is however possible to expand the tax net

to get more revenue for the Assembly. Income generating ventures like large scale farming, poultry and animal rearing can be embarked upon to increase the financial capability of the Municipal Assembly.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The study aims at finding out how waste management has affected the economic base of the Assin North Municipal Assembly and a result funds that could have been used in the development of the Municipality has been channelled in the management of waste. The study also seeks to find out other ways to fund waste management, so as to reduce the over reliance on the common fund for waste management activities.

The main objective of the study was to examine how waste management affects the revenue of the Municipality. Specifically the study attempts to;

- Determine how the Assembly generates its revenue
- Examine the types and volumes of waste generated in the Municipality.
- Assess the funding of waste disposal in the Municipality.
- Assess alternative means of funding waste management in the Municipality.
- Examine the effects of waste management on other developmental projects in the Municipality.
- Assess the effects of waste management on the Assembly's resources.

To arrive at these objectives, data from a field of study were collected between June and July 2008. A proportionate sampling procedure was employed in the study to select the subjects. The study was conducted in the two major towns in the municipality as most of the residents in the municipality reside there. In all 250 respondents were targeted for the study, 242 responded.

The responses were analysed with SPSS in frequencies and percentages. The percentages of respondents who are willing to contribute some amount of money for waste management activities, the amount the Assembly spents on waste management and other ways to manage waste were ascertained.

Summary

Waste management services in the municipality are concentrated in the urban areas with little or no services being carried out in the rural areas. The wastes in the municipality are disposed of mainly through refuse collection points, dumpsite and indiscriminate dumping.

Considerable number of respondents were willing to pay for refuse collection services if private companies takes over, a few however considers waste management as the sole responsibility of the municipal assembly and thus are not willing to pay anything for its collection.

Respondents identified imposition of tax, collection of tolls, and communal labour as alternative means to finance waste in the municipality. Majority of the respondents were also willing to sacrifice 1 – 3 hours of their

time during the weekends to involve themselves in communal labour to rid the community of filth.

A sizeable number of the residents in the municipality did not have toilet facilities in their homes and depends mostly on public toilets. The main wastes generated in the municipality are liquid and solid in nature. The municipality generates 28,000 tons of solid waste and 10,000 gallons of liquid waste.

The assembly funds waste management mainly through its internally generated funds and the district assembly's common fund.

Most of the financial resources of the assembly are spent on waste management. The amount spent on waste management in 2003(72,968,400) rose to 262,093,803 in 2007. Waste management thus affects the development of other important sectors like health infrastructure, education and rural electrification.

Conclusions

From the study the following conclusions are very clear:

- There are two main sources of revenue for the assembly – internal and external. The assembly generates its internal revenue mainly from rates, fines and fees, rent, investment and others. Its external revenue is through the district assembly's common fund.
- The main wastes generated in the municipality are liquid and solid in nature. The municipality generates 28,000 tons of solid waste and 10,000 gallons of liquid waste.

- The assembly funds waste management mainly through its internally generated fund and the district assembly's common fund.
- Imposition of taxes, contracting out, and collection of tolls, communal labour and privatization are other means that the assembly can fund waste management in the municipality.
- Waste management affects the development of the municipality, as amount spent on it, could have been channelled into other important sectors like health infrastructure, education and rural electrification.
- Most of the assembly's scarce resources are spent on waste management as the amount spent on waste management kept on rising every fiscal year.

Recommendations

- The Assembly should tax the individual for the waste generated and introduced pay as you throw service.
- The Assembly should also intensify education on waste generation, disposal and its effects on their health and the Assemblies revenue.
- The Assembly should tap the communal spirit of the people to organise periodic clean up exercise in the community to dispose of waste.
- The Assembly should recycle the huge tons of waste generated into a manure or biogas which could also generate revenue for the Assembly.
- The Assembly should pass bye laws to encourage individual homes to build toilet facility and also the Assembly should construct more toilet facility to augment the existing ones.

- The Assembly should pass bye laws to prevent indiscriminate disposal of waste in the Municipality.
- The environmental protection agency should intensify its education on the environment to increase the awareness on the ill effects of improper waste disposal.
- The Assembly should contract out the management of waste to private companies with the local government playing supervising role.
- Waste management services should reach all parts of the municipality, so as to enable all inhabitants of the district to benefit from the service.
- The Municipal Assembly should find different forms of funding by using non- monetary assistance from sister districts through the sharing of resources such as infrastructure, equipments, labour, materials or facilities that can provide mutual benefits and help sustain the financial capability of the Assembly.

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APPENDIX 1

QUESTIONNAIRE

I am a student of the Centre for Development Studies, University of Cape Coast working on the research topic: "The effect of waste management on district assembly's revenue, the case of Assin North District Assembly". Please could you kindly provide answers to the following questions? Any information given would be strictly confidential.

1. Sex of respondents: (i) [ ] Male (ii) [ ] Female
2. Age: (i) [ ] 18-20 (ii) [ ] 22-25 (iii) [ ] 26-29 (iv) [ ] 30-33 (v) [ ] 34-37 (vi) [ ] 38-41 (v) [ ] 45 and above [ ]
3. What is your occupation?.....
4. What is your marital status? (i) [ ] Married (ii) [ ] Living as married

   (iii) [ ] Single and never been married (iv) [ ] Separated

   (v) [ ] Divorced (vi) [ ] Widowed
5. Education Qualification (i) [ ] Primary (ii) [ ] Middle (iii) [ ] Secondary

   (iv) [ ] Technical/Commercial (v) [ ] Tertiary (vi) [ ] No formal education.
6. How long have you lived here? (i) [ ] 0-5 years (ii) [ ] 5-10 years

   (iii) [ ] 10-15 years. (v) [ ] 20 and above (vi) Born here (Native)

Please answer these questions by ticking [√] the appropriate answer and providing short answers to other questions where necessary.

7. Where do you deposit your refuse? (i) [ ] Dustbins provided

   (ii) [ ] Refuse collection point (iii) [ ] Dumpsite (iv) [ ] Burnt

   (v) [ ] Indiscriminate dumping (vi) Any other specify

   ……

8. Who is in charge of refuse collection in your area? (i) [ ] District Assembly

   (ii) [ ] Private company (iii) [ ] Not collected (iv) Other specify

   ……

9. How often is waste collected in your area? (i) [ ] Daily

   (ii) [ ] Twice a week (iii) [ ] Weekly. (iv) [ ] Not frequent

   (v) [ ] Not collected at all (vi) Other specify ……

10. Do you pay for refuse collection? (i) [ ] Yes (ii) [ ] No

11. If yes how much do you pay a month ……..……..

12. Whom do you pay to?.....

13. Are you prepared to pay more for improved service? (i) [ ] Yes (ii) [ ] No

14. Is there any other means that refuse collection can be improved?

    (i) [ ] Yes (ii) [ ] No

15. If yes, what other means do you suggest?.....

16. Do you want private companies to be involved in refuse collection?

(i) [ ] Yes (ii) [ ] No

17. If yes, are you prepared to pay more, for improved service delivery?

(i) [ ] Yes (ii) [ ] No

18. If No, why not? ……

19. There are important things to think about other than waste management

(i) [ ] Strongly agree (ii) [ ] Agree (iii) [ ] Slightly Agree

(iv) [ ] Neutral (v) [ ] Slightly Disagree (vi) [ ] Disagree (vi) [ ] Strongly Disagree

20. It is the duty of the district assembly to collect waste in the district

(i) [ ] Strongly agree (ii) [ ] Agree (iii) [ ] Slightly Disagree

(iv) [ ] Neutral (v) [ ] Slightly Disagree (vi) [ ] Disagree

(vii) [ ] Strongly Disagree

21. The assembly has done well in the provision of waste management service in the district. (i) [ ] Yes (ii) [ ] No

22. If No, Why not?

……

23. The assembly priority is not waste management (i) [ ] Yes

(ii) [ ] No

24. Do you think the district assembly spends huge sums of money on waste management? (i) [ ] Yes (ii) [ ] No

25. If Yes, how do you know?

……

26. Do you think waste management has affected development in the district?

(i) [ ] Yes (ii) [ ] No

27. Suggest other ways, which can be used to finance waste in the district

……

28. Are you prepared to contribute for the purchase of sanitary equipments?

(i) [ ] Yes (ii) No

29. If No, Why not?

……

30. Are you prepared to involve yourself in communal labour, in other to rid your area of filth? (i) Yes (ii) [ ] No

31. If Yes, how many hours or days are you willing to participate in communal labour?

……

32. Where do you deposit your waste water from the house? (i) [ ] Sink

(ii) [ ] Gutters (iii) [ ] Bush (iv) [ ] On the floor

(v) Any other specify ……

33. Is there anything that can be done to improve upon drainage in the district?

(i) [ ] Yes (ii) [ ] No

34. If Yes, specify what can be done

……

35. If No, state why? ……..

36. Do you nave toilet facility in your house? (i) [ ] Yes (ii) [ ] No

37. If Yes, which of the following do you have? (i) [ ] Bucket/Pan

(ii) [ ] Water closet (iii) [ ] KVIP

38. If No, do you patronize the public toilet when the need be?

(i) [ ] Yes (ii) [ ] No

39. If your answer to question (38) is No, what do you do?

(i) [ ] Ease myself in a chamber pot which is later emptied

(ii) Practice free range defecation (iii) Any other specify

……

40. If your answer to question (38) is Yes, do you pay when you visit the public toilet? (i) [ ] Yes (ii) [ ] No

41. Are you satisfied with services provided in the toilet?

(i) [ ] Yes (ii) [ ] No

42. If No, will you be willing to pay more when private companies takes over?

(i) Yes (ii) [ ] No

APPENDIX 2

INTERVIEW SCHEDULE

I am a student of the Centre for Development Studies, University of Cape Coast working on the research topic: "The effect of waste management on district assembly's revenue, the case of Assin North District Assembly". Please could you kindly provide answers to the following questions? Any information given would be strictly confidential.

1. Do you have knowledge about how the Assembly generates its revenue?

   (i) Yes (ii) No

2. Which of the following provides revenue for the district assembly?

   (i) [ ] Market toll (ii) [ ] Bridge toll (iii) [ ] Property rates

   (iv) [ ] Transport toll (v) [ ] Farming (vi) [ ] Common Fund

   (vii) Other specify ……

3. What type of waste is commonly generated in the District?

   (i) [ ] Animal remains/feaces (ii) [ ] Plant remains/wood

   (iii) [ ] Rubber/plastics (iv) [ ] Paper (v) [ ] Scrap metals

   (vi) [ ] Other specify ……

4. How does the Assembly collect waste generated in the District?

   (i) [ ] Door to Door (ii) [ ] Bin collection Point

   (iii) [ ] Sweeping public places (iv) [ ] Other specify

   ……

5. How many tones of the following wastes are generated annually in the district?

   (i) Solid waste ……..

   (ii) Liquid waste ……

6. What are the waste generation rates for the following wastes?

   (i) Solid ……..……

   (ii) Liquid ……..…….

7. How much of these wastes are actually collected and treated?

   ……

8. What method(s) is/are used to treat these wastes?

   (a) Solid waste

   ……..

   (b) Liquid waste

   ……

9. How often is the refuse transported to the disposal site?.....

10. Do waste management services reach all parts of the District?

    (i) [ ] Yes (ii) [ ] No

11. If No, how does other part of the district who do not benefit from waste management services dispose of waste

    ……

12. What are the various ways the Assembly funds waste management?

    (i) [ ] Individual levy (ii) [ ] Household levy

    (iii) [ ] Assembly common fund (iv) Other specify

    ……

13. Do you wish the Assembly finds other alternative means of disposing waste?

(i) [ ] Yes (ii) [ ] No

14. If Yes, which of the following alternative do you suggest?

(i) [ ] Privatization (ii) [ ] Engaging the services of NGO's

(iii) [ ] Voluntary collection/Funding (iv) [ ] Household/Individual Levy

(v) [ ] Communal Labour (vi) Other specify

……

15. In what ways can waste management services be improved in the district? ……

16. Has funding of waste management affected development in the district?

(i) [ ] Yes (ii) [ ] No

17. If Yes, which areas of development have been affected? (i) [ ] Health (ii) [ ] Transportation (iii) [ ] Education (iv) [ ] Water

(v) [ ] Electricity (vi) Housing (vii) Others specify

……

18. What are the problems and challenges associated with waste management practices in the district?

……

19. How many people are employed by the assembly to dispose of waste?

……

20. How much is their wages daily/weekly/monthly/annually?

……

21. How much is spent on provision of logistics for waste disposal annually? ……..……

22. How much does the assembly spend on maintenance of vehicles and others annually

……

23. How much does the assembly spend on fuel annually

…….

24. What percentage of the revenue of the assembly is allotted for waste management?

……...

25. How much is spent on acquiring land fill site? ……

26. How the assembly does get the money it spends on waste management? ……

27. On the average how much the assembly does spends on waste management?

(i) Daily ……..

(ii) Monthly ……..

(iii) Annually ….…….

28. How has this affected other areas of development in the district?

……

29. How do you rate the cost of waste management in the district?

(i) [ ] Low (ii) [ ] High

30. What policies should the District Assembly put in place to reduce the high expenditure on waste management?

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