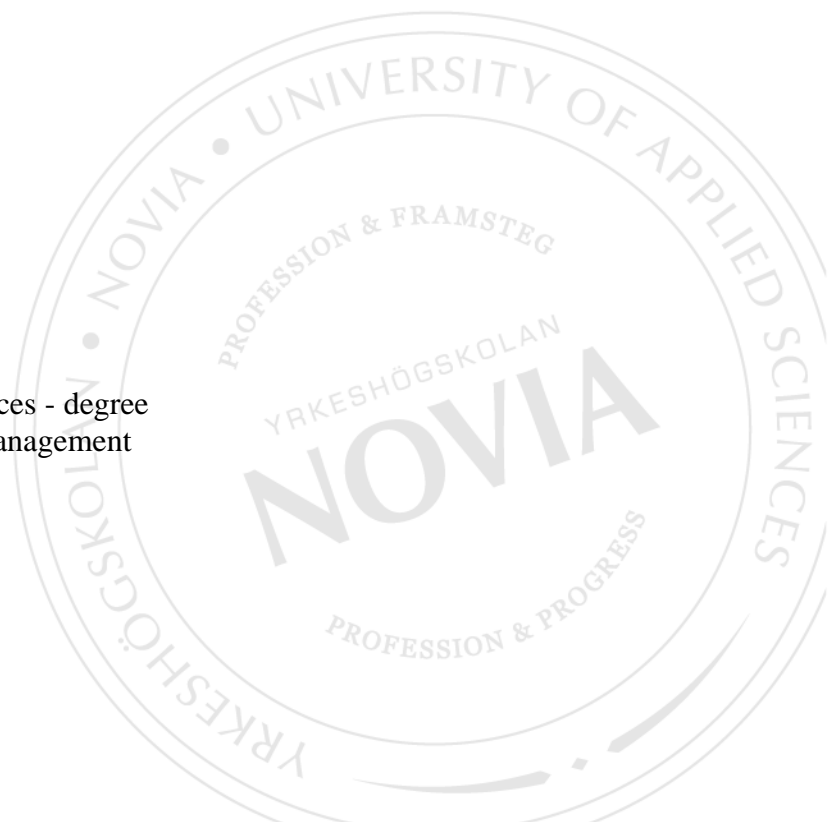


# **Knowledge, Attitudes and Practices of Coastal Communities on Waste Management in Ghana**

Author: Nasir Kofi Essuman  
Thesis for Novia University of Applied Sciences - degree  
Degree Programme of Sustainable Coastal Management  
Raseborg/ Raasepori, 2017



## **BACHELOR'S THESIS**

**Author:** Nasir Kofi Essuman

**Degree Programme:** Sustainable Coastal Management

**Supervisors:** Maria Söderström

### **Title: Knowledge, Attitudes and Practices of Coastal Communities on Waste Management in Ghana**

---

**Date:** 09/01/2017

**Number of pages:** 42

**Appendices:** 3

---

#### **Abstract**

Waste management has been a worldwide issue which most countries are finding the best ways of dealing with. Managing waste improperly poses threat to the health of individuals and the environment. Ghana as a developing country, its coastal communities are faced with a lot of challenges regarding waste management due to actions towards waste management.

This research seeks to examine the knowledge, attitudes and practices of coastal communities on waste management and how their actions have affected their health as well as their environments. The study area comprises of three different coastal communities which includes Mamprobi, Glefe and Gbegbeyise.

It was realized that waste is causing more harm to the lives of people living at the coast and the environment since waste is dumped indiscriminately, not usually collected by the waste management companies, not seen as a resource and government seen as the only one responsible for managing waste in the countries especially at the coast.

To ensure proper waste management practices, it was recommended that the community members should be involved in decision making, given the opportunity to manage their own waste as well as educating them on waste management.

---

**Language:** English    **Key words:** Waste Management, Knowledge, Attitudes, Practices and Coastal Communities.

---

## **ACKNOWLEDGEMENT**

I thank the Almighty God for my life and taking me through the challenges I faced during my studies.

I would like to express my sincere gratitude to my supervisor Maria Söderström, who has been a great inspiration to me throughout my studies and Anna Granberg, Head of programme for her motivation, support, guidance and time for me throughout my studies. Also, big thanks go to Maria Kihlström, Veronika Bäckman, Soile Gustafsson and all the staffs in Sustainable Coastal Management for making an impact in my life.

I would like to show my profound appreciation to Alhaji Abu Mohammed of Department of Community Development for the opportunity he gave me and all the staffs working under as well as collaborating with Department of Community development who supported me during data collection and my time there.

I would like to thank my family for supporting me regardless the situation and, to all my friends especially Priscilla Osei for making an impact in my life.

## Table of Contents

1	INTRODUCTION AND AIMS .....	1
1.1	INTRODUCTION.....	1
1.2	PROBLEM STATEMENT .....	2
1.3	OBJECTIVES OF THE STUDY .....	4
2	LITERATURE REVIEW .....	5
2.1	CONCEPT OF WASTE.....	5
2.2	SOLID WASTE .....	5
2.3	SOLID WASTE MANAGEMENT .....	7
2.4	WASTE MANAGEMENT HIERARCHY .....	8
2.5	WASTE MANAGEMENT IN AFRICA .....	9
2.6	EDUCATION AND AWARENESS OF WASTE MANAGEMENT.....	10
2.7	THE ATTITUDE AND BEHAVIOR OF WASTE MANAGEMENT .....	11
2.8	WASTE PRACTICES.....	11
2.9	WASTE AND ENVIRONMENT (FLOOD).....	14
2.10	SANITATION PROFILE OF GHANA .....	17
3	METHODOLOGY .....	19
4	RESULT .....	20
4.1	COMMUNITIES.....	20
4.2	GENDER OF RESPONDENTS .....	20
4.3	KNOWLEDGE OF SANITATION.....	21
4.4	ATTITUDES TOWARDS WASTE MANAGEMENT .....	23
4.5	PRACTICES TOWARDS WASTE MANAGEMENT.....	26
4.6	RESPONDS FROM GOVERNMENT INSTITUTIONS.....	28
5	DISCUSSION.....	30
6	CONCLUSION AND RECOMMENDATION .....	34
7	REFERENCE .....	35
	APPENDIX I .....	39
	APPENDIX II.....	41
	APPENDIX III.....	42

## Figures

Figure 1: Hierarchy of waste management. (Southern California Conversion Technology, w.y) .	8
Figure 2: Flood caused by blocked drainage (David, 2016).....	15
Figure 3: Respondents.....	20
Figure 4 Respondents who said YES to question on knowledge of waste management.....	21
Figure 5: Respondents who said NO to question on knowledge of waste.....	22
Figure 6: Respondents who were NOT SURE to question on knowledge of waste.....	22
Figure 7: Attitudes of Mamprobi respondents towards waste management.....	23
Figure 8:Attitudes of Glefe respondents towards waste management.....	24
Figure 9: Attitudes of Gbegbeyise respondents towards waste management.....	25
Figure 10: Practices of Mamprobi respondents towards waste management.....	26
Figure 11: Practices of Glefe respondents towards waste management.....	27
Figure 12: Practices of Gbegbeyise respondents towards waste management.....	28

## Tables

Table 1: Source of waste.....	6
Table 2: Comparison of solid waste management practices by income level in the world.....	12
Table 3: Flood issues with awareness and action in some developing Countries. (Lamond et al, 2012).....	16
Table 4: Interviewees from different institutions.....	29

# 1 INTRODUCTION AND AIMS

## 1.1 INTRODUCTION

Waste management has recently been the concern of every country in the world since waste has become an issue. Improper management of waste poses threat to the health of individuals as well as the environment which if dealt with, improves the quality of life by reducing its negative impact.

In this 21st century, waste management is part of the important service which is sustaining our society especially in urban areas. It has now become a basic human right which is part of basic human needs. This basic human right involves ensuring proper sanitation, solid waste management, provision of potable water, shelter, food, energy, transport and communications which are all beneficial to society and the economy as a whole. (UNEP, 2015)

Urban cities in Africa are increasing at a high rate which is seriously contributing to the amount of generated waste. This means that various types of waste are generated with the changes in human consumption patterns as well as the structure of economic activities. Ensuring proper waste management in the urban area will enhance sustainable development and a better standard of living among residents. Rapid urban growth is putting pressure on limited resources in low-income countries. Also, waste management services in urban areas turn out to be inadequate which have contributed to life and health-threatening issues and locations. (UN-Habitat, 2014)

Ghana, being one of the African countries with rapid growth in its urban cities, is having problems with waste management. The country is faced with yearly flooding due to improper waste management caused by inadequate collection, transportation, disposal and monitoring of waste. The waste therefore, ends up in drainage systems and gutters, blocking the constant flow of rainwater.

In Accra and other places, waste collection has been an issue causing most people to improperly dump their solid waste which usually gets washed into the drains. This makes the drains to be blocked by plastics and other waste. Also, litter on streets and gutters are very common due to indiscriminate disposal of solid waste. This usually leads to floods where in 2011, most lives were

lost and destroyed livelihood as well as economic value. During the incident, 14 people were killed, 43,000 were affected, and 17,000 lost their homes, with damage to roads, waterways and bridges as well as 100 incidents of cholera were identified a week after the occurrence of the flood. (UNEP/OCHA, 2011)

Most developing countries which Ghana is no exception perceive waste to be an unwanted material with no intrinsic value which has had an impact on their attitudes towards waste disposal. Management of waste is also seen to be the sole responsibility of the government forgetting that proper waste management is public obligation and benefit. It is therefore the responsibility of every individual and institutions to ensure clean environment.

## 1.2 PROBLEM STATEMENT

The perception about solid waste disposal in Ghana especially the coastal areas which is part of the major cities, has made waste collection system very difficult to be managed. People dispose waste wherever they deem is convenient to them, regardless whether it is a road, a playground or a park. They dispose of waste indiscriminately without realizing that it is going to affect the public health and environment as well as affect the living standard of future generations.

Most people in Ghana see waste to be collected and dumped in the landfill site so therefore do not regard it as a resource while other countries such as Sweden are making money out of waste generated. Their perception is causing a serious challenge to the waste management companies. Instead of waste management companies to deal with the control of waste generation, storage, collection, transportation and processing of waste into useful resources which will positively affect public health, economy and environment, they only collect the waste and dump it to the landfills, making them to be waste collection companies. This means that, with right mindset on solid waste disposal, there will be a health environment as well as income generation from waste.

There is the mindset that waste generated must be collected by the government and therefore government have contracted waste management companies to do so. This mindset contributes to

the reckless attitude of littering in the coastal areas. They have a saying that goes, if we do not dump waste indiscriminately, waste management companies would have no job to do.

For a change to take place, people turn to forget they need to start from themselves. If waste generated is sorted and dumped at the designated places, waste management institutions can effectively and efficiently do their job as required which means that for proper waste management system to be in place, individuals, organisations and government institutions must come together and work collectively. This will enable the waste management companies to convert waste into useful resource as well as income generation.

The thesis will therefore look at Knowledge, Attitudes and Practices of Coastal Communities on Waste Management in Ghana.



### 1.3 OBJECTIVES OF THE STUDY

The main aim of this study is to investigate the relationship between the knowledge, attitudes and practices among people living in the coastal areas concerning waste management. Households in Accra were examined on waste management operations through a survey.

The specific objective of the study includes:

1. To find out the knowledge level of individuals in coastal communities about waste management.
2. To find out the attitudes of individuals in coastal communities towards waste management.
3. To identify the environmental practices concerning waste management that individuals in coastal communities engage in.
4. To find out the perception of institutions regarding environmental practices of waste management of individuals in coastal communities.

## 2 LITERATURE REVIEW

Waste, has been an issue for all countries in the world due the impact it has on health, environment and the economy. This chapter seeks to review literature by looking at the concepts of waste and other related topics.

### 2.1 CONCEPT OF WASTE

Waste according to the EU Waste Directive (Article 1(a) of Directive 75/442/EEC), is any substance which the owner discards or intends to discard. Morrison et al 2000 as cited by Lutui 2001, see's waste as any material classified to be waste by national legislation or any materials that is no longer useful that needs to be disposed of. Waste can be defined in many forms depending on the category or context its being used. It can basically be defined as any material considered to be useless which means it is no longer need for it intend purpose. waste can the seen in two perspectives which is primary and secondary function. In regards to the primary function, something became waste when it cannot perform its actual purpose. On the other hand, when something is no longer useful to someone, it is useful to another person thus someone's waste is someone's raw material. This shows how waste is not dependent on specific definition.

### 2.2 SOLID WASTE

According to Augustino et al (2015), solid waste is made up of organic and inorganic waste materials that comes about as a result of human and animal activities and is no longer needed which needs to be discarded due to its value loss to the user. Disposing solid waste improperly causes diseases like cholera, diarrhea, among others. Solid waste can be categorized into sources which are domestic household waste, industrial waste, commercial waste, agricultural waste, building and demolishing waste, among others.

The table 1 below shows the source of waste which was adopted by Hoornweg, Daniel with Laura Thomas (1999).

**Table 1: Source of waste.**

Source: Hoornweg, D. & Laura, T. (1999).

<b>SOURCE</b>	<b>TYPICAL LOCATION</b>	<b>TYPES OF SOLID WASTE</b>
Residential	Single-family and multifamily dwellings, low-medium, and high-rise apartments.	Food wastes, rubbish, ashes, paper, cardboard, plastics, textiles, special wastes
Commercial/Municipal	Stores, restaurants, markets, office buildings, hotels, medical facilities, and institutions	Food wastes, rubbish, ashes, demolition, Paper, cardboard, plastics, wood, glass, metals, special and construction.
Industrial	Construction, fabrication, light and heavy manufacturing, refineries, chemical plants, mining etc.	Demolition and construction wastes, special wastes, occasionally hazardous wastes, Housekeeping wastes, packaging, and food wastes.
Open areas	Streets, alleys, parks, vacant plots, playgrounds, and recreational areas.	Special wastes, rubbish, paper, plastics, and glasses.
Treatment plant site	Water, wastes water, and industrial treatment processes.	Treatment plant wastes, principally composed of residual sludge

Agricultural	Field and row crops, orchards, vineyards, dairies, feedlots, and farms	Spoiled food wastes, agricultural wastes, rubbish, hazardous wastes
--------------	--	---

2.3 SOLID WASTE MANAGEMENT

Solid waste generated are different from country to country or region to region which means the management system also varies. Solid waste is generated due to a lot of factors which includes the abundance and type of natural resource available, the lifestyle of citizens as well as their living standards. Solid waste is embarrassing and difficult to discuss with reason that policy-making and political discussions must deal with taboos in various locality which affects the process of arriving at achievable goals (UN-HABITAT, 2010).

Waste is mostly contaminated with nightsoil regardless the climatic differences. Countries located in humid, tropical, and semitropical areas, wastes generated are characterised by a high concentration of plant litter whereas waste generated in countries with seasonal change may contain an abundance of ash due to coal or wood used for cooking and heating especially during winter. (UNEP, 2005)

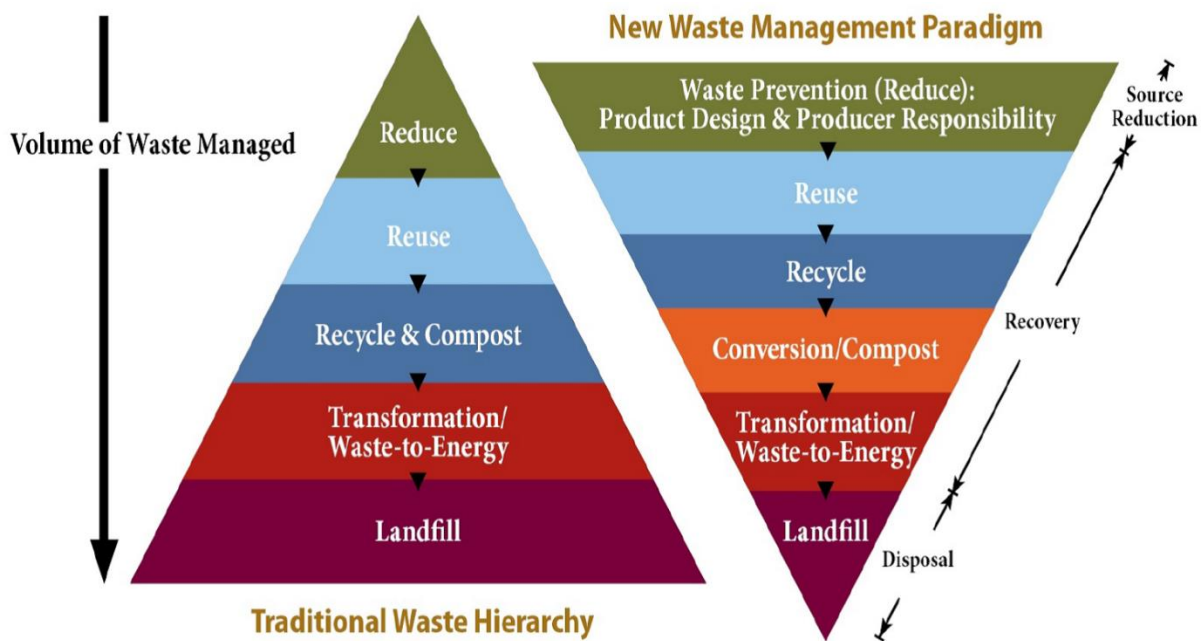
EU Waste Directive 2008, defines waste management to” mean the collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites, and including actions taken as a dealer or broker”

Management of solid waste is a problem in most developing countries as compared to the developed countries. The difference between the developing and the developed countries is not only on waste composition but also the standard of waste management services provided. In this regards, the attention of developing countries are given to the attainment of proper collection, treatment and disposal whereas developed countries are concentrating on turning waste into resources. (Mungure, 2008) Ghana being one of the developing countries is currently facing difficulties in dealing with solid waste management, from collection, treatment to disposal since waste is not considered to be a resource. This has made to waste management companies turn to be waste collectors which has limited their function.

## 2.4 WASTE MANAGEMENT HIERARCHY

Everyone has the responsibility of ensuring a healthy environment by reducing the amount of waste generated. This responsibility has brought about waste management hierarchy with the aim of minimizing the amount of waste generated from entering the landfill or dump sites. The earliest usage of the 'waste management hierarchy' appears to be Ontario's Pollution Probe in the early 1970s (Hoorweg & Bhada-Tata, 2012). Its emphasis is on the 3Rs which is Reduce, Reuse and Recycle. The hierarchy helps in the enhancement of economic activities and the habit of reducing environmental impacts from waste disposal. (Sreenivasan et. al, 2012).

The figure 1 below shows the hierarchy of waste management (traditional waste hierarchy and new waste management paradigm).



**Figure 1: Hierarchy of waste management.** (Southern California Conversion Technology, w.y)

The waste hierarchy is in pyramid form which shows how action must or needs to be taken. From the new waste management paradigm, the first action must be taken on preventing the generation of waste, followed by reducing waste generation (e.g. through re-use), recycling, composting or anaerobic digestion, recovery and waste to-energy and if energy is not recovered from processes then it ends up in landfill. Waste disposal on landfills is the last resort only when waste has not been prevented, diverted or recovered in the preceding steps. (UNEP,2013) This new waste management paradigm is the reverse of the traditional waste hierarchy with the aim of not ensuring compliance of waste management regulation. Its focus is on improving limited resources in the form of preventing waste generation as well as ensuring that waste is treated as a resource.

## 2.5 WASTE MANAGEMENT IN AFRICA

Waste handling in developing countries are mostly two system approach which is formal and informal system. The formal system is managed by the government where responsibilities are given to municipality to ensure safe, reliable and cost effective collection and disposal of solid waste which often requires large financial resources, making it very difficult to deal with waste management issues. (Gombya & Mukunya, 2000) The informal system is managed by individual or private dealers which includes communities of scavengers and private associations. They usually see the potential aspect of certain materials for domestic purposes such as plastics, paper, bottle and cans. The private dealers charge for their operation or services form residents which involves collecting, sorting, recycling and selling waste. (UNIDO, 2003)

In Africa, the problem of waste management is not only the accumulation of waste in cities or streets but also the ineffectiveness of waste management authorities and the government to tackle the problem of waste appropriately. In order to understand the problems of waste management, it is therefore important to check policies structure, implementation strategies as well as the economic framework of the country. For effective governance to solve waste management problems, there is the need for adequate managerial and organizational structure, accountability and transparency in decision making. (Mungure, 2008)

## 2.6 EDUCATION AND AWARENESS OF WASTE MANAGEMENT

Lack of education and awareness of effective waste management practices is one of the major issue in developing countries. According to McAllister (2015), a study in Gaborone, Botswana, found that even though citizens were aware of recycling and other sustainable waste-management techniques, this does not necessarily translate into participation in pro-environmental activities such as recycling initiatives. When people lack interest in environmental issues, it means that they are not well informed which affect their actions and also makes them feel not included in waste management decision making.

In Ghana, due to lack of education and awareness in waste management, individuals in various communities turn to blame the government for improper waste management. According to McAllister (2015), lack of interest in the environment brings about a culture of non-participation of communities in decision-making processes which enhances lack of responsibility for pollution and waste issues. When citizens are given education or awareness about waste, they turn to be informed as well as know the essence of waste management which will make them responsible. Keeping them informed or educated means improving their knowledge in waste management which will call for participation in decision making. The community's participation in waste management activities from decision making, structural reforms among others, will increase their sense of belonging and ownership which can bring about improvement rather than blaming.

According to Martin and Garcia (2014), cited by McAllister (2015), it has been recognized by researchers that it is important to create sustainable waste systems as well as promoting environmental citizenship amongst community members through improved public awareness and community participation in waste management.

A research conducted in Malaysia by Aini and colleagues (2002) resulted that, to overcome the solid waste crisis, "conscience of the individual needs to be raised through environmental awareness and concern, inculcation of sustainable consumption practices and education on waste management." They went further to say that environmental awareness and knowledge about environmental conservation were found to affect recycling attitude positively, so therefore waste managers need to take steps to enhance the public knowledge on waste management. (McAllister, 2015)

## 2.7 THE ATTITUDE AND BEHAVIOR OF WASTE MANAGEMENT

The negative behavior with solid waste management in most developing countries are on littering which has a lot of causes. These causes include lack of social pressure to prevent littering, absence of realistic penalties or consistent enforcement, and lack of knowledge of the environmental effects of littering (Al-Khatib et al., 2009). Other causes are due to amount of litter found in a particular location and the number of waste collection bins available on a site. (McAllister, 2015)

Most communities have the attitudes of not concern of waste management which reduces their responsibility for the environment. This is with the reason that most community members are not involved in decision making so therefore develop the attitude of not concern which makes them not responsible for waste management (McAllister, 2015). This attitude differs among socio-economic groups. However, the attitude and behaviour of individuals can be positively influenced by implementing quality waste management systems to properly manage waste generated. When requirements for basic food and shelter absorb the attention of the largest portion of the community, then many environmental values are neglected. This means that people who satisfy or are satisfied with their basic needs are sensitive to management of waste.

## 2.8 WASTE PRACTICES

Waste management practices has a great impact on our health and the environment. A good solid waste system is like good health thus if things are done right people will have comfortable life but on the other hand, if things go wrong, it is a big and urgent problem which makes everything else seems less important (UN-Habitat, 2010). Practicing good waste management means materials will be efficiently used and, waste will be reduced. Waste management varies from country to country which call for different practices but with the help of waste management hierarchy, good practice can be enhanced.

Countries in Africa are challenged with implementing the new paradigm of waste management. Practices of the old hierarchy system where emphasis is given on waste to dumpsite/landfill still holds and this is causing a lot harm to public health and the environment. This is attributed to income levels. According to McAllister (2015), attitude of not concern about waste management differs among socio-economic groups thus, wealthier socioeconomic groups are more likely to make a difference when it comes to environmental problems because they feel the need to impact



more in addressing and fixing the problem. It is shown that, the practices usually differ among income level relating to activities of solid waste management.

Table 2 below shows comparison of Solid Waste Management Practices by Income Level in the world as classified in Appendix III .

**Table 2: Comparison of solid waste management practices by income level in the world**

(Hoorweg & Bhada-Tata, 2012)

<b>Activity</b>	<b>Low Income</b>	<b>Middle Income</b>	<b>High Income</b>
Source Reduction	Programs are not organized, even though reuse and low per capita waste generation rates are common.	Some forms discussion of waste reduction, but not often incorporated into an organized program.	Organized programs with given priority to the three 'R's' (reduce, reuse, and recycle). Efficient and actual flow of product design.
Collection	Sporadic and inefficient. Service is limited to willing to pay customers (wealthy) which makes overall collection below 50%.	Improved service and increased collection from residential areas. Collection rate varies between 50 to 80%.	Collection rate greater than 90%.
Recycling	It's through the informal sector and waste picking.	Involvement of informal sector, some high technology for sorting and processing facilities.	Collection services for recyclable material, high technology for sorting and processing facilities, high level of regulation as well as

			increasing attention towards long-term markets.
Composting	Not often undertaken formally even though the waste stream has a high percentage of organic material.	Large composting plants are regularly unsuccessful, the reason being contamination and operating costs.	Generally at both backyard and large-scale facilities.
Incineration	Not common, and usually not successful due to high capital, technical, operation costs, high moisture content in the waste, and high percentage of inerts.	Some incinerators are used, nevertheless experiencing financial and operational difficulties.	Prevalent in areas with high land costs and low availability of land (e.g., islands).
Landfilling/ Dumping.	Low-technology sites (generally, open dumping of wastes), high pollution and regular burning of waste.	Some controlled and sanitary landfills with some environmental controls.	Sanitary landfills with a combination of liners, leak detection, leachate collection systems, gas collection and treatment systems.
Costs	Collection costs represent 80 to 90% of the municipal solid	Collection costs represent 50% to 80% of the municipal solid	Collection costs can represent less than 10% of the budget.

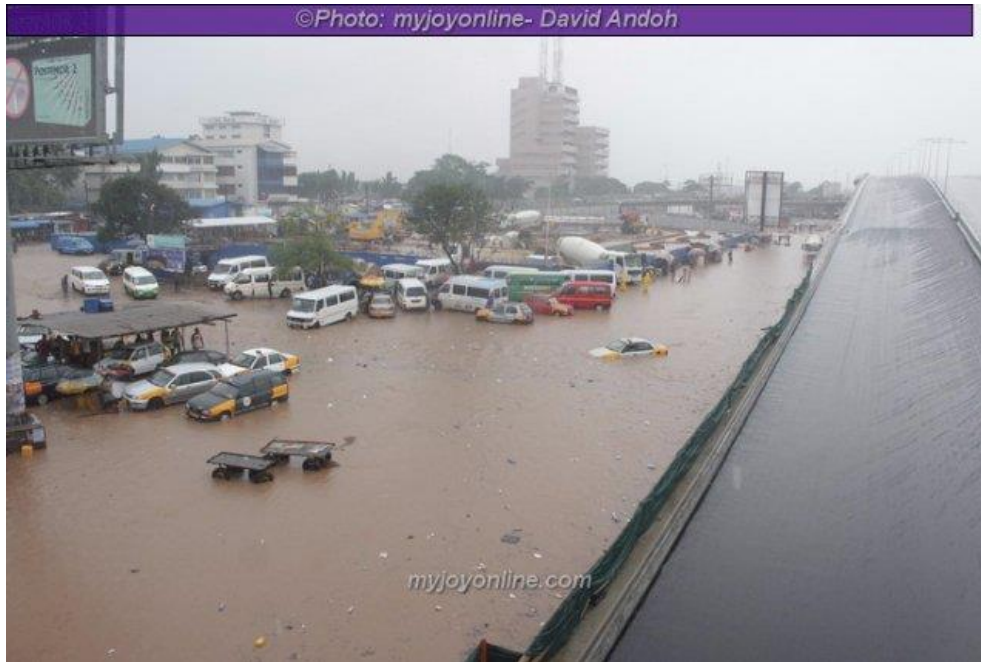
	waste management budget.	waste management budget.	
--	--------------------------	--------------------------	--

2.9 WASTE AND ENVIRONMENT (FLOOD)

Waste that is not well managed poses health and environmental threats (water, air and land pollution). According to Hoornweg & Bhada-Tata (2012), health concerns of the public forms the basis of solid waste management programs which is very important to ensuring proper health of the public. Solid waste that is not properly collected and disposed can be a breeding ground for insects, vermin, and scavenging animals, and can thus pass on air and water borne diseases. As cited by Hoornweg & Bhada-Tata (2012), Surveys conducted by UN-Habitat indicated that in areas where waste is not collected often, the incidence of diarrhea is twice as high and acute respiratory infections six times higher than in areas where collection is regular (UN-Habitat 2009).

The environment is negatively impacted when waste is improperly disposed or not frequently collected. Municipal solid waste in low and middle-income countries are mostly dumped improperly especially in low-lying areas and land adjacent to slums. This waste (Municipal solid waste) is usually mixed with infectious medical and hazardous waste which turns to be harmful not only to the environment but to waste pickers as well. This threatens the environments by contaminating groundwater and surface water via leachate, as well as air pollution from burning of waste that is not properly collected and disposed. (Hoornweg & Bhada-Tata, 2012)

The figure 2 below shows flooded area in the city of Accra caused by improper waste management (David, 2016).



**Figure 2: Flood caused by blocked drainage** (David, 2016)

Flooding in Accra has been happening frequently, in 2007 hundreds of people had to be relocated to safer locations. The flooding situations happened in 1995, 1999, 2001, 2008, 2011 and 2015 causing havoc. On June 3<sup>rd</sup>, 2015, Ghana faced a tragedy where the flood killed a lot of people in the city of Accra. Flooding in Ghana is mostly linked to blocked drainage caused by poor waste management (Boadi & Kuitunene, 2003). However, populations in Accra are hardly aware of the drainage issues related to flooding and regard waste management as the role of the government (Sam, 2009). It is observed that the population are not resilient and adaptive to the existing risk and the level of preparedness, recovery and response is very low (Ahadzie & Proverbs, 2010). The table 3 below is showing flood issues with awareness and action in some developing Countries.

**Table 3: Flood issues with awareness and action in some developing Countries.** (Lamond et al, 2012)

<b>Case study</b>	<b>Problem identified</b>	<b>Community awareness</b>	<b>Municipal action</b>	<b>Community action</b>
Bamako (Mali)	Poor waste management a major factor in floods	Awareness was raised during the programme	Structural drainage improvement was carried out	Local waste collection system set up. Disposal still a problem
Accra (Ghana)	Blockage of drainage causes flooding	Residents not aware	Authorities appear overwhelmed	Residents regard it as the role of the government
Cotonou (Benin)	Indiscriminate dumping of waste	Yes and some have taken action	Peripheral areas neglected as the focus is on the city centre	Locals trained to collect and gain revenue from waste
Maputo (Mozambique)	Flooding caused by inadequate drainage in the city	Awareness low but being targeted by education programmes	Some urban drainage improvement programmes in Maputo	Communities still dump rubbish in drains, causing major problems in 2010 flood
Lagos (Nigeria)	Flooding due to blocked drainage	High awareness in community	New city wide strategy of waste disposal	Very few community initiatives
Marikina (Philippines)	Flooding partly due to waste clogging the river	Residents made aware by the programme	River dredging and penalties for dumping	Residents comply but waste still arrives from further upstream
Jakarta (Indonesia)	Blocked channels cause widespread flooding	Residents aware of the problem	Government plans to dredge channels but hampered by	Local community based schemes successful but waste is carried

			informal settlements	from upstream areas
Mumbai (India)	Plastic bags blamed for flooding	Poor awareness	Ban on use of plastic bags	Poor compliance with ban
Guyana (South America)	Clogged and inadequate drainage leading to flooding	Identified by residents as important.	Authorities have other priorities	In one ward CBO had cleared drains, this ward had not flooded
Mexico City (Mexico)	Waste blocks drains and leads to flash flooding	Appears to be low awareness	Programmes focus on other priorities	No evidence of community action
Managua (Nicaragua)	Waste in the rivers worsen flooding	Awareness is poor	Network of micro dams to collect rubbish and silt	Low compliance, flooding still an annual event

According to Lemond et al, (2012), poor solid waste management contributes to urban flooding across the globe and, as urban populations increase, is likely to be an increasingly important factor. The control of solid waste within areas at risk of flooding has the potential to reduce risk by minimising the amount of waste blocking drainage channels. They went further to say that, reduced accumulation of waste in general will reduce the environmental impact of flooding and has multiple other benefits to health and wellbeing.

## 2.10 SANITATION PROFILE OF GHANA

Ministry of Local Government and Rural Development is in-charge of waste management in Ghana. They decentralize the duties of waste management to the Metropolitan, Municipal and District Assemblies (MMDAs). The Metropolitan, Municipal and District Assemblies through their Waste Management Departments and their Environmental Health and Sanitation Departments collect and dispose of solid waste from various communities.

They supervise the decentralized Metropolitan, Municipal and District Assemblies (MMDAs) for waste management. Nevertheless, regulatory authority is vested in the Environmental Protection Agency (EPA) under the auspices of the Ministry of Environment and Science. The Metropolitan, Municipal and District Assemblies are in charge for the collection and final disposal of solid waste through their Waste Management Departments (WMDs) and their Environmental Health and Sanitation Departments. The policies for managing hazardous, solid and radioactive waste emanate from the National Environmental Action Plan which includes the Local Government Act (1994), Act 462, the Environmental Protection Agency Act (1994), Act 490, the Pesticides Control and Management Act (1996), Act 528, the Environmental Assessment Regulations 1999, (LI 1652) the Environmental Sanitation Policy of Ghana (1999), the Guidelines for the Development and Management of Landfills in Ghana, and the Guidelines for Bio-medical Waste (2000). (Sanitation-Ghana, 2014)

### 3 METHODOLOGY

Out of estimated 300 respondents (100 from each community), data for the study was collected from 242 respondents in three communities in the coastal areas which includes 82 respondents from Mamprobi, 72 respondents from Glefe and 88 respondents from Gbegbeyise. They were interviewed to know their knowledge, attitudes and practices with regards to waste management. Also, 42 interviewees from government institutions were interviewed. The sources of collected data includes primary and secondary sources of data collection.

The primary data collection focuses on the application of questionnaire, interviews and participant observation. In obtaining primary information, questions (as can be seen in appendices I and II) were developed to find out their knowledge, attitude and practices towards waste management in their various locality. The questionnaire were given out to respondents who could read to fill and with those who could not were guided through the questions with the helped of a translator. The respondents comprise of students, fishermen, traders, teachers, carpenters, and hairdressers. The translator and I went to various households to get respondents to fill the questionnaire since most of them could not speak English and even if they could speak English, they preferred speaking in their local language. Simple random sampling was used to select respondents which gave everyone in the community the chance to be interviewed. Interviews were conducted with key informants, youth clubs in the communities and representatives of institutions in charge of waste management in the Ghana. Some were contacted through telephone calls and others where contacted in person. The interviews were conducted in English and lasted for about 30 minutes. Participant observation was used to examine the problem at various districts. The observation was usually done during training workshops organized by the Department of Community Development, Department of Social Development and the Accra Metropolitan Assembly on waste management where I happened to be part of those to facilitate the workshop.

Furthermore, secondary data relevant to municipal solid waste management were obtained from internet, journals, books among others to show contemporary knowledge on the subject.



## 4 RESULT

### 4.1 COMMUNITIES

1. Mamprobi
2. Glefe
3. Gbegbeyise

### 4.2 GENDER OF RESPONDENTS

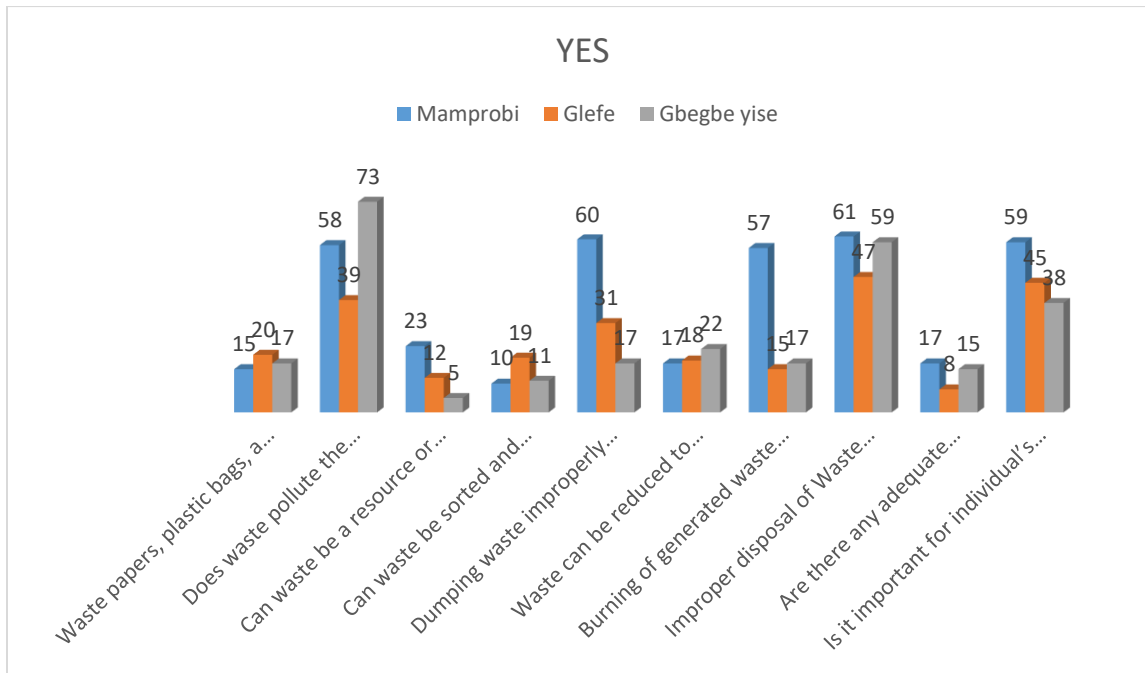
The below figure 3 shows the gender of respondents in three coastal communities.



**Figure 3: Respondents**

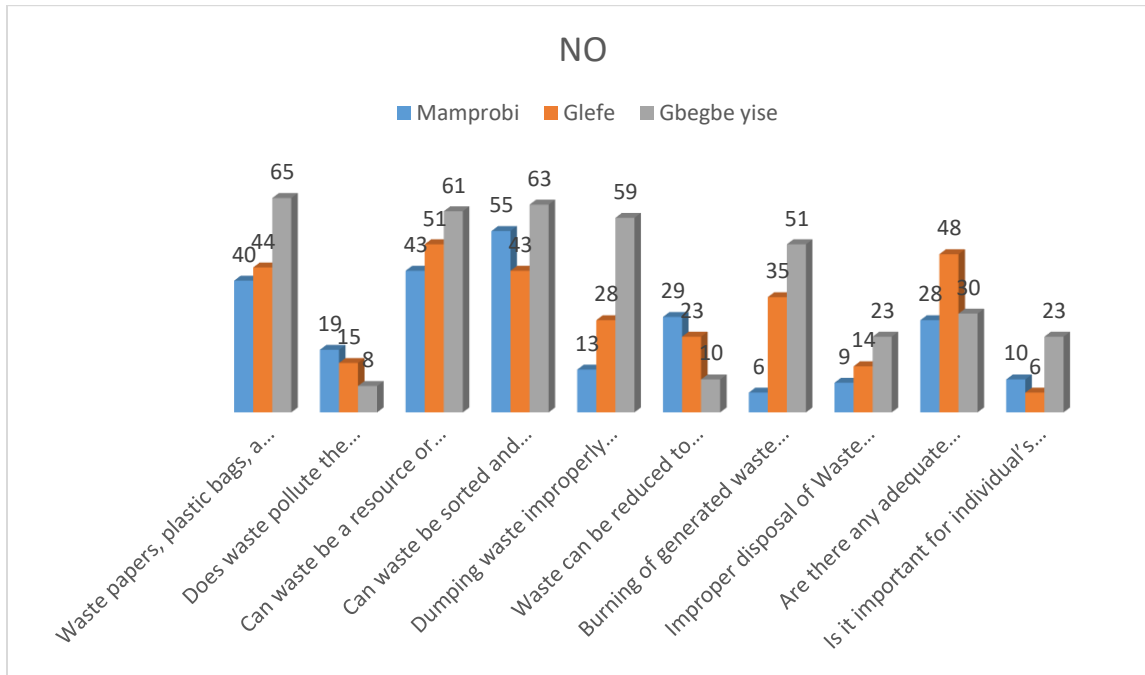
### 4.3 KNOWLEDGE OF SANITATION

The below figure 4 shows respondents who said YES to question on knowledge of waste management.



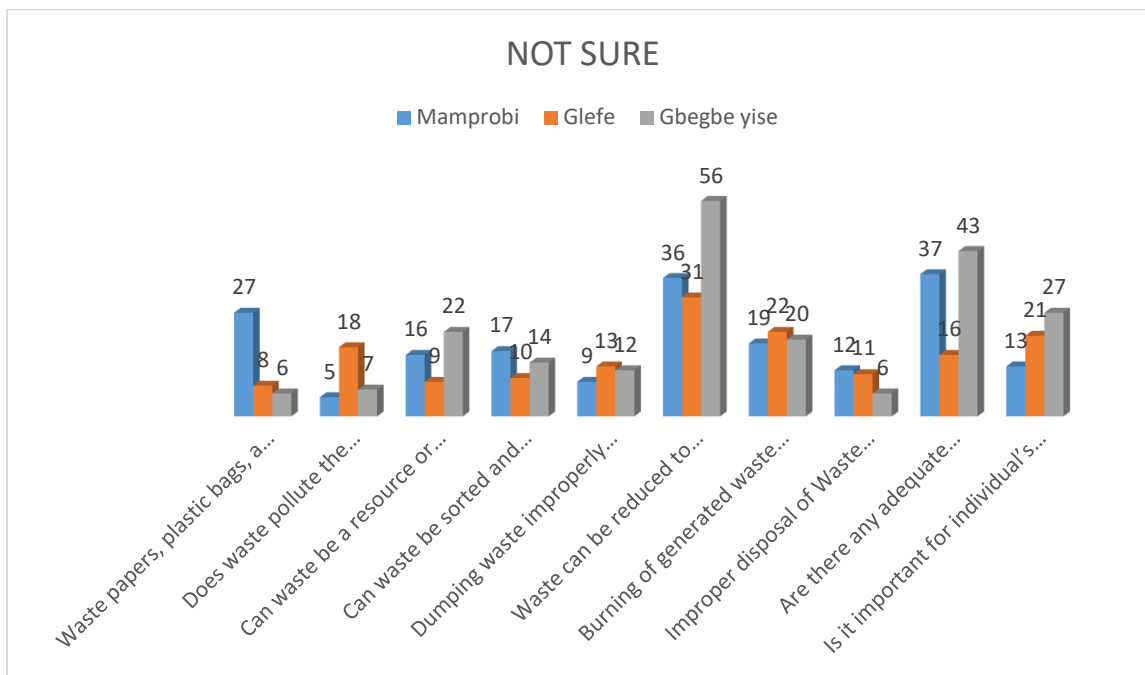
**Figure 4 Respondents who said YES to question on knowledge of waste management**

The figure 5 below shows respondents who said NO to question on knowledge of waste.



**Figure 5: Respondents who said NO to question on knowledge of waste**

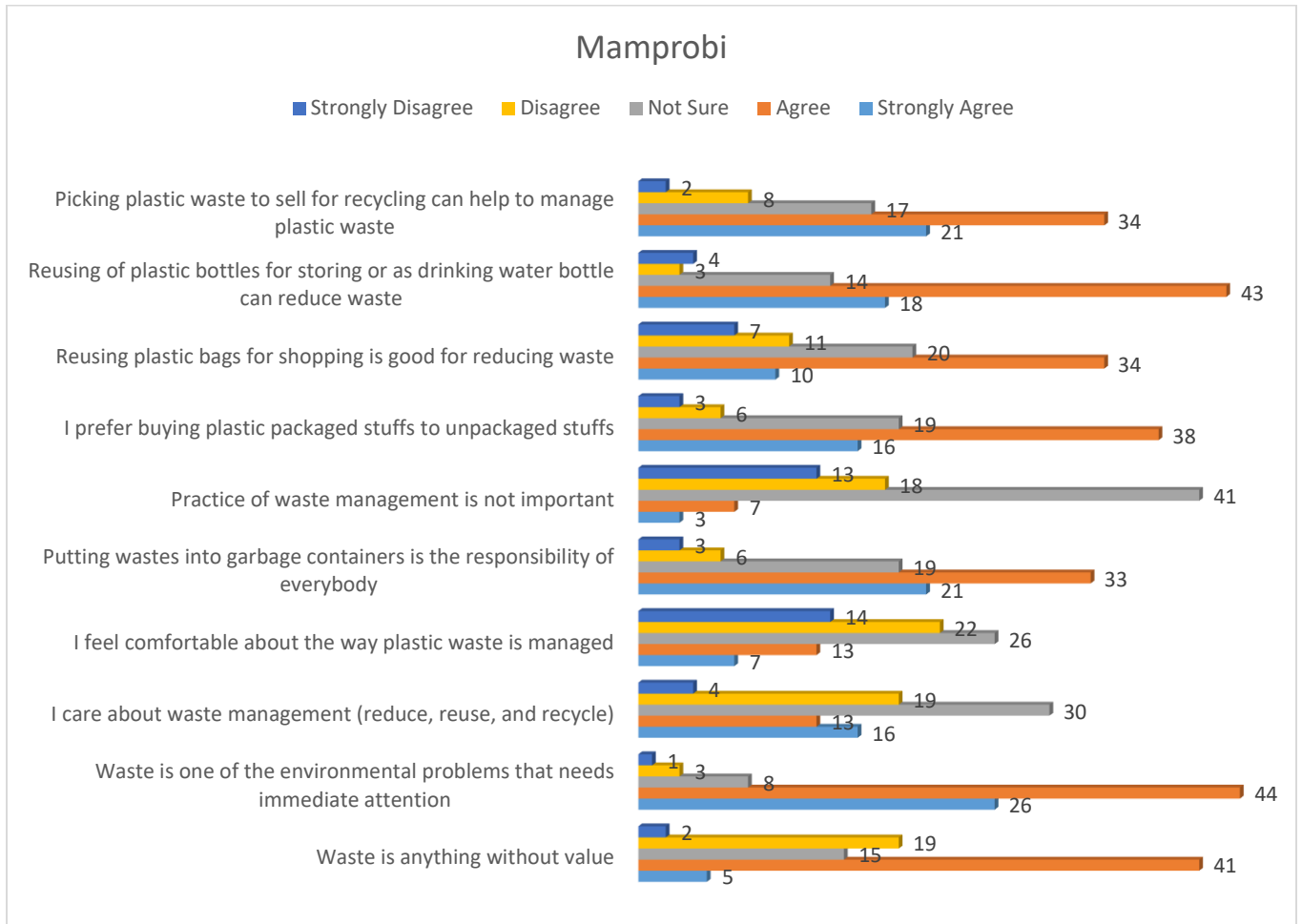
The figure 6 below indicates respondents who were NOT SURE to question on knowledge of waste.



**Figure 6: Respondents who were NOT SURE to question on knowledge of waste**

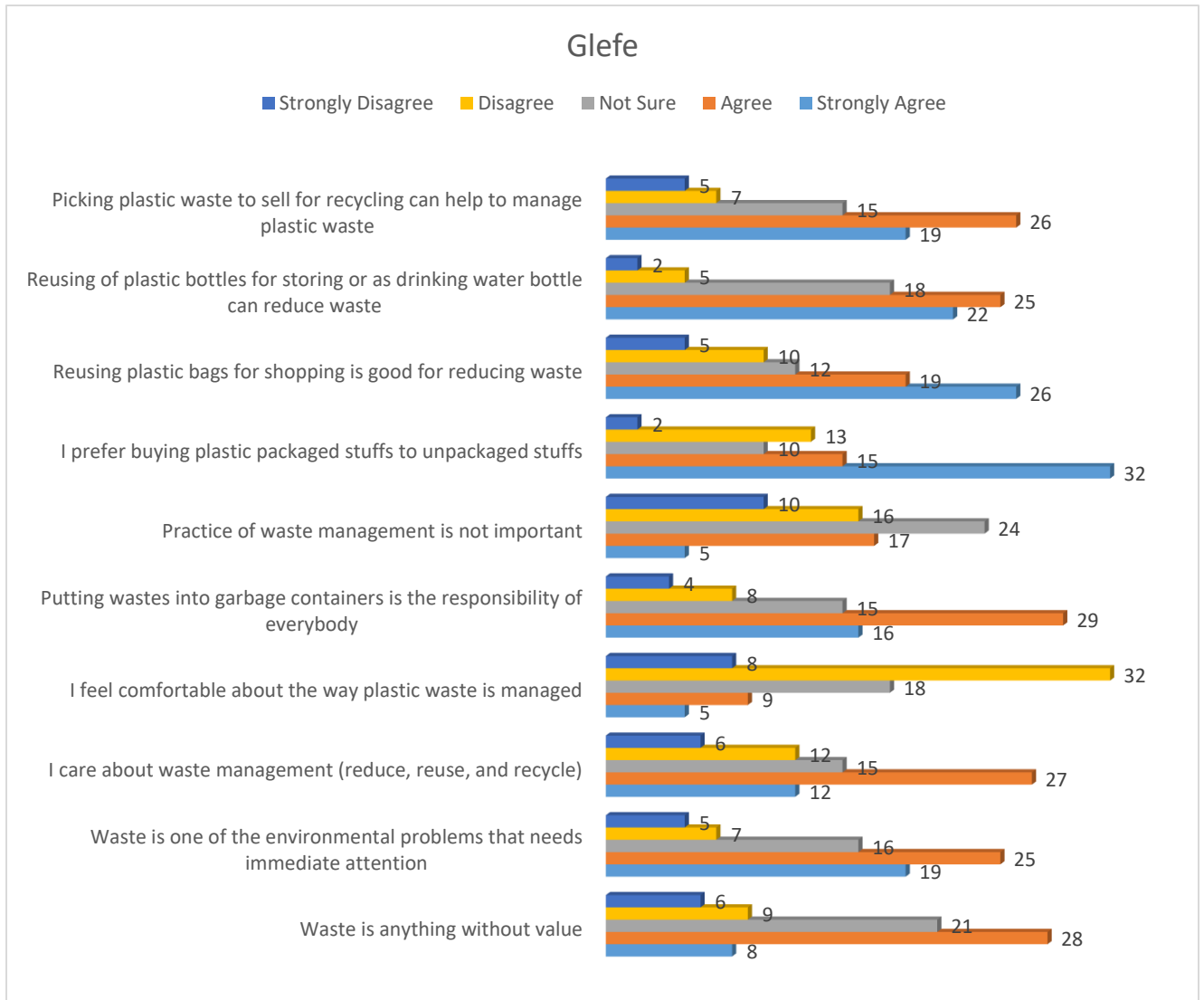
#### 4.4 ATTITUDES TOWARDS WASTE MANAGEMENT

The below figure 7 indicates attitudes of Mamprobi respondents towards waste management.



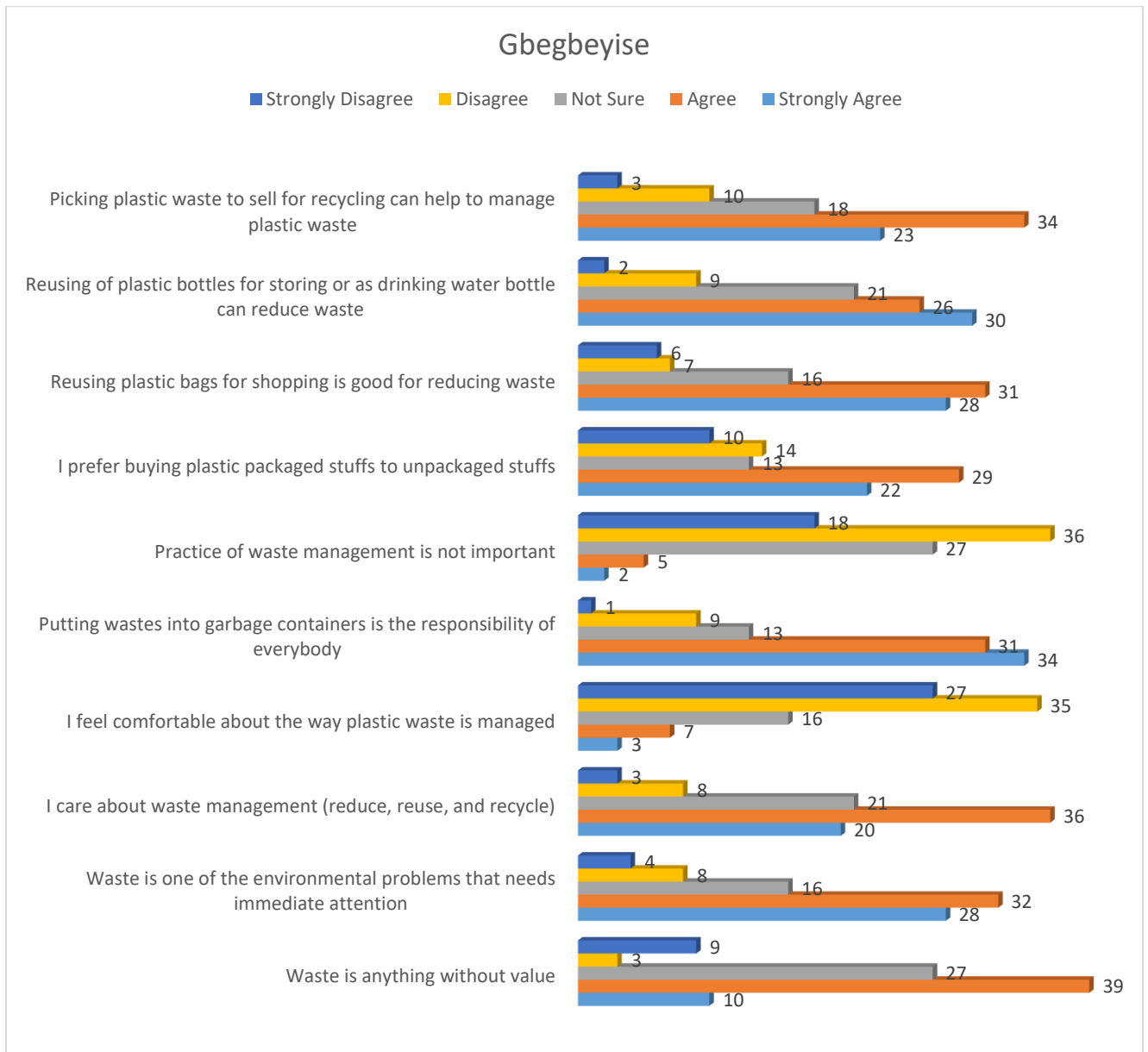
**Figure 7: Attitudes of Mamprobi respondents towards waste management**

The below figure 8 indicates attitudes of Glefe respondents towards waste management.



**Figure 8:Attitudes of Glefe respondents towards waste management**

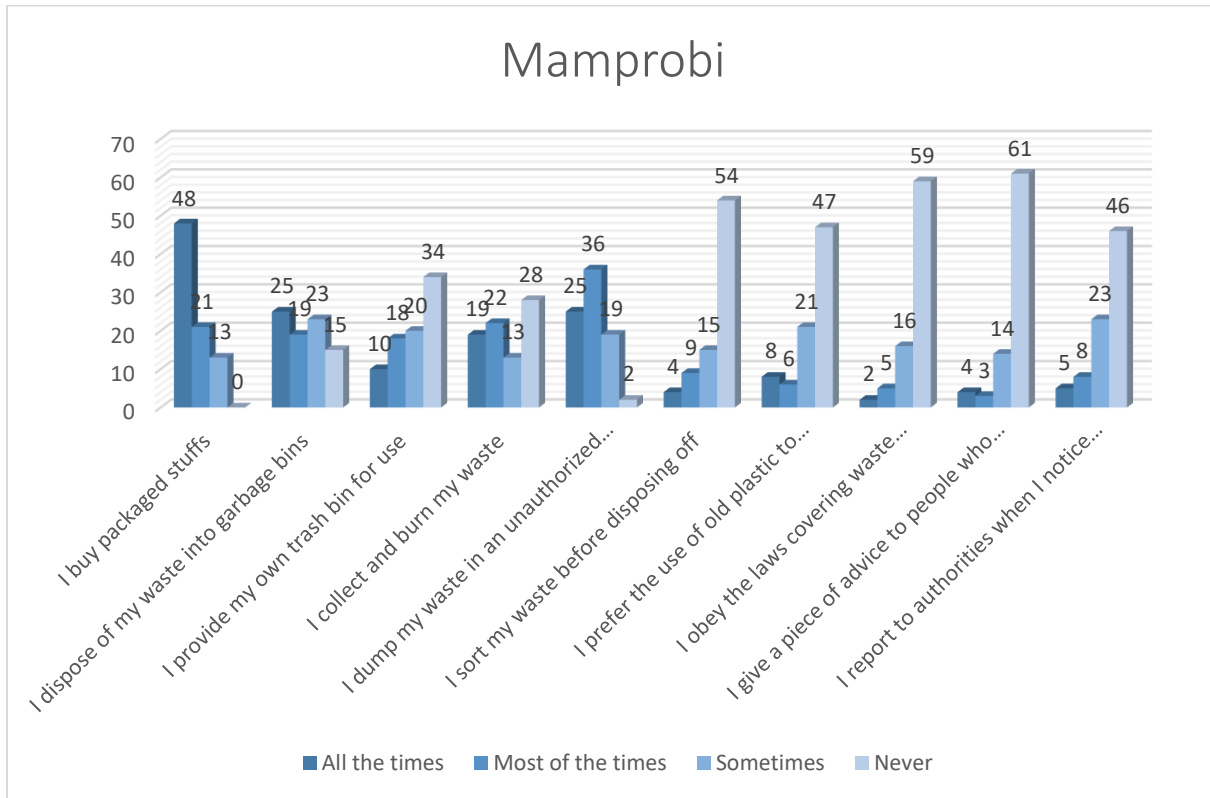
The below figure 9 indicates attitudes of Gbegbeyise respondents towards waste management.



**Figure 9: Attitudes of Gbegbeyise respondents towards waste management**

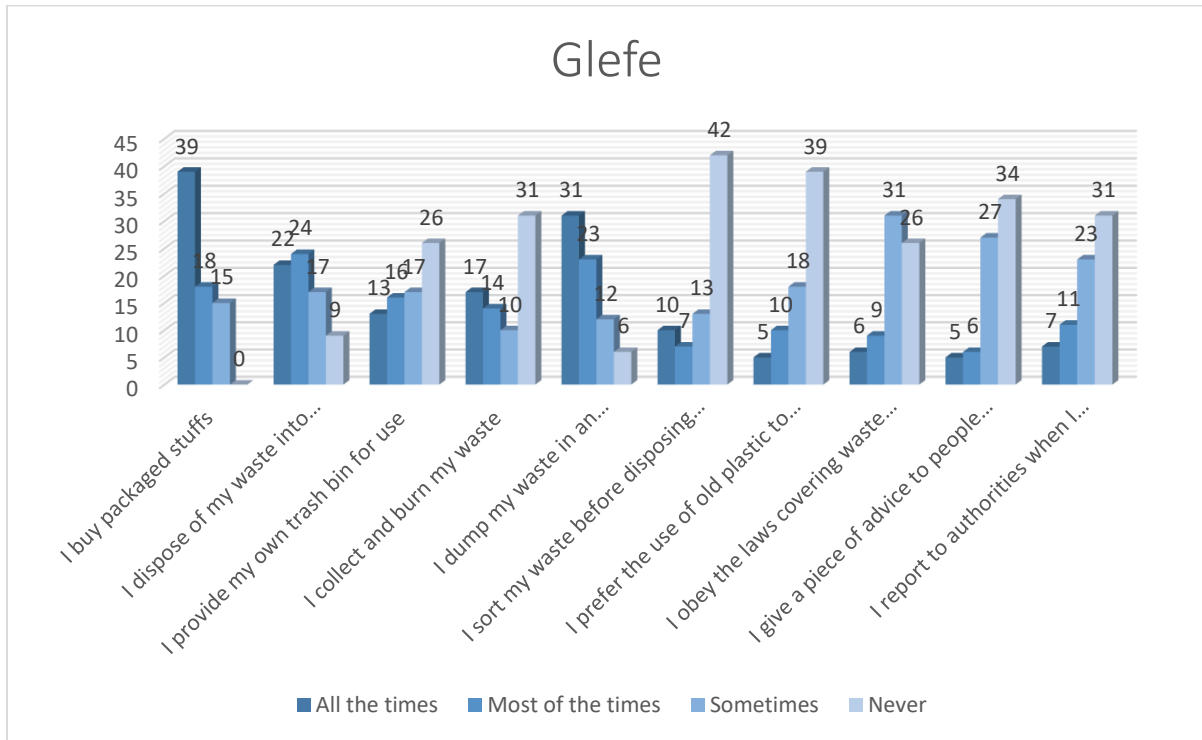
#### 4.5 PRACTICES TOWARDS WASTE MANAGEMENT

The figure 10 below shows practices of Mamprobi respondents towards waste management.



**Figure 10: Practices of Mamprobi respondents towards waste management**

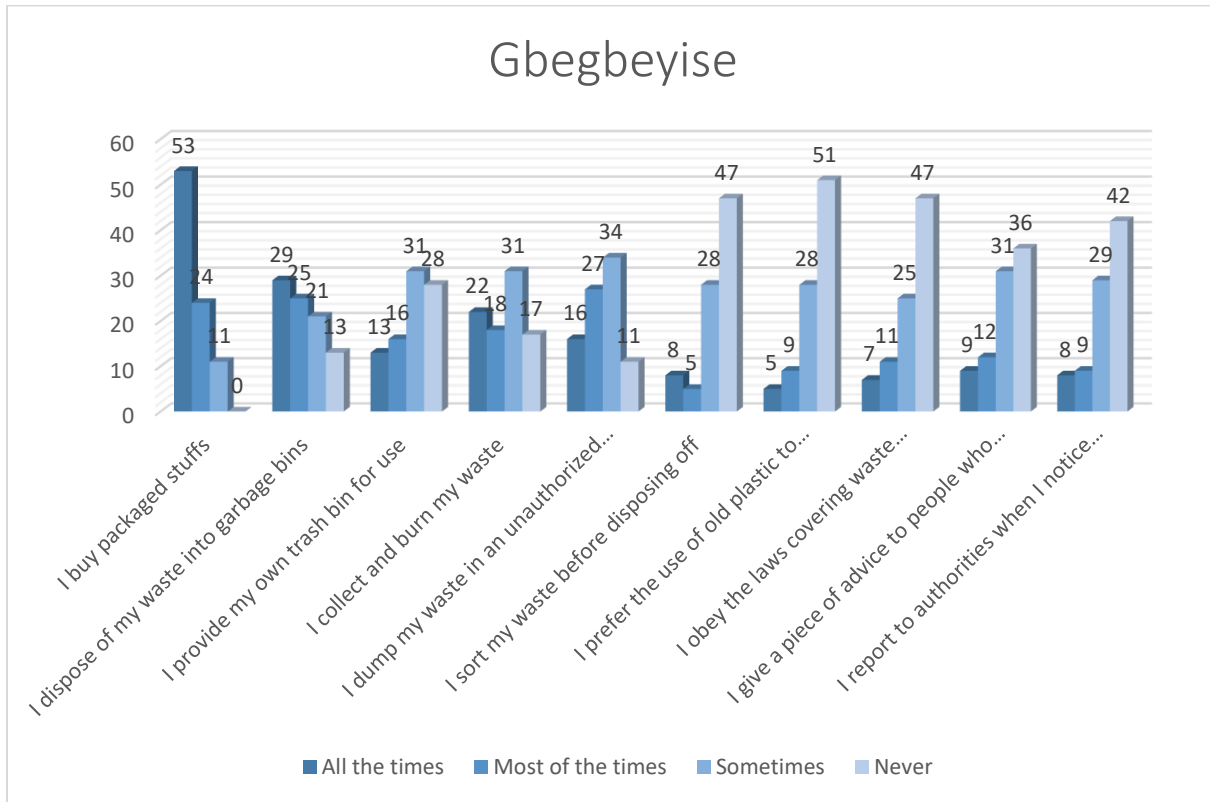
The figure 11 below shows practices of Glefe respondents towards waste management.



**Figure 11: Practices of Glefe respondents towards waste management**



The figure 12 below shows practices of Gbegbeyise respondents towards waste management.



**Figure 12: Practices of Gbegbeyise respondents towards waste management**

#### 4.6 RESPONDS FROM GOVERNMENT INSTITUTIONS

Some institutions were interviewed to know what they think about waste management in the coastal communities as can be seen in Appendix II.

The table 4 below shows the number of interviewees from different institutions.

**Table 4: Interviewees from different institutions**

<b>INSTITUTIONS</b>	<b>No. of interviewee</b>
<b>Department of Community Development</b>	6
<b>Department of Social Development</b>	4
<b>Town and Country Planning Department</b>	8
<b>Environmental Health and Sanitation Departments</b>	11
<b>Accra Metropolitan Assembly</b>	13

In an interview with representatives from the above institutions, they said the communities need to be educated on waste management to enhance their knowledge, attitudes and practices towards waste management. They went further to say that when it comes to the side of the government on waste management, the problem is with funding, logistics and road network even though attitude of people is of concern.

It was realized that waste management in coastal communities is very bad that it has brought unhealthy environment and hunger. Most of the institutions were one way or the other helping to solve the waste management problems through adult education, mass meetings, study group meetings and posters. The institutions stated some of their challenges which include inadequate logistics, refusal to pay for waste collection, inadequate landfill site, not ready to listen attitudes, lack of funds, coastal communities not well educated and mismanagement of government property. Even though the institutions are facing challenges, some have done nothing about it as others have recruited people to environmental health, organized regular clean up exercise as well as educating people. It was also realized that the coastal communities were usually not involved in decision making concerning waste management which makes them not responsible or concerned. The waste management problem in the coastal communities usually happens with the act of dumping waste indiscriminately. This has affected the environment making it unattractive to tourists, killing species in the sea as well as bringing about diseases such as cholera among others. They therefore call on the government to ensure enforcement of the law, provide education on waste management, acquire landfill sites, acquire machines for waste separation and build recycling centers. They went further to say that individuals and government need to play their respective roles to help solve waste management issues in the country.

## 5 DISCUSSION

Waste management in coastal communities has been a big issue for the government and the local people in Ghana. Having interviewed representatives of some government institutions, they said waste issues are linked to a lot of factors which include inadequate service coverage, poor quality of service, lack of financial resources, lack of trained personnel, poor governance, among others. As we all know, improper solid waste management can be harmful to the environment, health as well as the well-being of the public with other living and non-living organisms within and beyond the polluted area.

This research looked at why improper solid waste management is an issue by studying the community's knowledge, attitudes and practices towards waste management. The three communities' actions towards waste management was as a result of unclear understanding of responsibilities, thus who is in-charge of waste management. It was realized from the study, that the communities had a notion where government is responsible for anything regarding waste. Their mindset on waste management has put pressure on the government. As Mungure (2008) said, the attention of developing countries are given to the attainment of proper collection, treatment and disposal unlike the developed countries turning waste into resources. The actions of the three communities confirms what Mungure, 2008 said which means the government is looking for the best way to address this issue.

Conducting research on the knowledge of waste management of three different coastal communities, it can be seen in the result that, most people from the three communities (49% from Mamprobi, 61% from Glefe and 73% from Gbegbeyise) knew what waste was. Even though they knew what waste was and its implication, nothing was done about it which means that waste ends up on the streets, gutters and nearby bushes. Dumping waste indiscriminately creates a breeding grounds for rodents and insects which increases the risk of spreading diseases. Improper dumping of waste does not only create the risk of spreading diseases but also ends up creating choked drains and blocked waterways which has the possibility of causing flood during the wet season. It was realized that they were aware of the effect on their environment. This result agrees with finding of McAllister, (2015) in his study in Gaborone, Botswana which said that citizens were aware of recycling and other sustainable waste-management techniques, this does not necessarily translate into participation in pro-environmental activities such as recycling initiatives. His finding applies

in these coastal communities in Ghana as well. Upon interacting with the community members, it was realized that they knew how bad their environment has been and the reason was that, they are waiting on the government to come collect the waste. This shows there is the need for education to enhance their knowledge as McAllister, (2015) said in his finding that environmental awareness and knowledge about environmental conservation were found to affect recycling attitude positively, so therefore waste managers need to take steps to enhance the public knowledge on waste management.

As shown in the result (attitudes towards waste management), 50%, 39% and 44% from Mamprobi, Glefe and Gbegbeyise respectively, agreed that waste has no value which then contributes to the way they act towards waste management. From observation, people in these communities burn waste in an open area considered to be their final disposing sites. Burning waste pollute the air which increases the risk of health hazards as well as destroying the environment. It was observed that, burning and littering is a common act among the communities. Their activity keeps destroying the environment. When attention is not given to the management of solid waste, it leads to serious pollution and spreading of diseases. Al-Khatib et al., (2009), pointed out, that negative behavior towards waste management comes about due to lack of social pressure to prevent littering, absence of realistic penalties or consistent enforcement, and lack of knowledge on environmental effects of littering. The attitude in most communities in Ghana is ‘I do not care’ when it concerns waste management because that is the responsibilities of the waste management companies. This has been a very big challenge for the waste management companies which make them not function efficiently and effectively. There is a negative saying or attitude in most communities in Ghana which is “if I do not litter, the waste companies will get no job doing”. This attitude has turned the waste management companies into waste collectors’ companies. This act shows why the three communities sees waste to be something without value.

From the result (practices towards waste management), it was realized that 48 respondents from Mamprobi, 39 respondents from Glefe and 53 respondents Gbegbeyise preferred buying packaged stuffs to unpackaged stuffs. As most packed stuffs are made of plastic which is not degradable, it causes harm to the environment (air, water and land pollution). More waste is usually generated as most people buy packed stuffs which makes the communities prone to environmental and health hazards since those packs are not reduced, reused or recycled. This practice does not support the

new paradigm of waste management which focus on the 3Rs (Reduce, Reuse and Recycle) as can be seen in figure 1. This makes it very difficult for communities in Ghana to adopt to the new paradigm so therefore the old hierarchy system is still in place which means the waste management companies only collect the waste to the landfill. It was also realized in the result that, 72% from Mamprobi, 36% from Glefe and 53% from Gbegbeyise did not know about laws concerning waste management which makes them not to be law abiding. This shows how law enforcer have failed to pay adequate attention to inspection and monitoring. Failure to ensure procedures are put in place to engage the communities in environmental issues leads to weakening the effectiveness of environmental laws. Their poor knowledge about laws concerning the environment have contributed to their practices towards waste management.

It was also realized from the 42 interviewees from institutions who are in-charge of waste management, that proper waste management has been a big challenge to their institutions and the country as well. They agreed to the fact that community's knowledge, attitudes and practices towards waste management needs to be worked on. With this reason, they think if the communities are educated on waste management, it will enhance their knowledge which will go along way to affect their attitudes and practices. They think adult education, mass meetings, study group meetings and posters will help improve waste management. The interviewees came up with some challenge facing the government since they are institutions representing the government when it comes to waste management. They also testified to the fact the communities are not usually involved in decision making. This shows, that waste management can be successful when the government institutions and the local communities collaborate by putting each other's interest into consideration. This can impact the environment by making the communities attractive to tourists, reduce killing of species in the sea as well as diseases such as cholera among others which will improve the social, economic, and environmental aspect of the communities and the country as whole.

Looking at knowledge regarding the concept of waste, it was realized that 49%, 61%, 74% of respondent form Mamprobi, Glefe and Gbegbeyise respectively knew what waste was. This shows that people living in Gbegbeyise had more knowledge than Glefe and Mamprobi. Upon asking the respondent if they were aware waste can pollute the environment, it was realized that 71% of

respondents from Mamprobi, 54% of respondents from Glefe and 83% of respondent from Gbegbeyise agreed to the fact that waste pollutes the environment. This shows that all three communities are aware of the impact of improper waste management. But the question here is why are they not practicing proper waste management since they have knowledge about waste and are aware of its impact.

From the analysis of the research findings in the three communities, it is evident that their knowledge, attitudes and practices need to be improved. It was realized from the study that none of the three communities were practicing the appropriate method of waste management because there was no community engagement and sense of ownership with regards to decision making on waste management. Involving the communities in environmental projects will build their capacity and enhance management of the environment. From participant observation, it was realized that indigenous knowledge was taken for granted while community members were always ready to give information or contribute to matter that affect their lives and their environment. This shows that when the authorities in charge of waste management engage or collaborate with the communities, proper waste management can be achieved. Involving them will not only make proper waste management achievable but also sustainable.

In as much as this research work looks at the knowledge, attitudes and practices towards waste management in the communities, it could not cover all the issues relating to their act towards waste management even though the respondents gave out their knowledge as shown in the result. This calls for further investigating in:

- Developing an Effective Waste Management and Disposal Strategy with Local Communities
- Bottom-Up Approach to Sustainable Solid Waste Management
- The Environmental and Health Effects of Waste Management
- Waste Management Training and Capacity Building for Local Communities

## 6 CONCLUSION AND RECOMMENDATION

It was realized from the study that, waste management in all the three coastal communities in Ghana had challenges which needs immediate actions. Waste is dumped indiscriminately which ends up blocking all the water ways and drainage system. This has led to spread of diseases and floods causing loss of lives. It was realized, that they were aware of their actions pertaining to waste management since they are seeing the effect but the blame is pushed on the government as not doing its job. All their actions towards waste management is a result of not regarding waste as a resource but rather something that needs to be sent to the landfill. This shows that, their knowledge, attitudes and practices towards waste management need to be improved.

Based on the findings of the study, the following recommendations were made:

- Community members should be involved in decision-making regarding their waste management.
- Communities should be taught how to manage waste and given the opportunity to manage their own waste.
- There should be education on laws regarding waste management and ensuring enforcement of law by the government.
- Mass media (radios, televisions, newspapers, posters, magazines) should be used to facilitate change in attitudes, practices and perception of the communities towards waste management.
- Teaching waste management in schools should be encouraged and developed in the school curriculum.

## 7 REFERENCE

- Ahadzie, D. K., & Proverbs, D. G. Flooding and Post Flooding Response Strategies in Ghana. *WIT Transactions on Ecological Environment*, 33: p. 281-291, 2010.
- Aini, M. S., Razi, A. F., Lau, S. M., and Hashim, A. H. (2002). Practices, attitudes and motives for domestic waste recycling. *International Journal of Sustainable Development and World Ecology*, 9(3), 232.
- Al-Khatib, I. A., Arafat, H. A., Daoud, R., and Shwahneh, H. (2009). Enhanced solid waste management by understanding the effects of gender, income, marital status, and religious convictions on attitudes and practices related to street littering in Nablus – Palestinian territory. *Waste Management*, 29(1), 449-455.
- Augustino, C., Bahati, L., and Alexanda, M. 2015, Assessing the Awareness, Knowledge, Attitude and Practice of the Community towards Solid Waste Disposal and Identifying the Threats and Extent of Bacteria in the Solid Waste Disposal Sites in Morogoro Municipality in Tanzania. Available:  
[https://www.researchgate.net/profile/Augustino\\_Chengula/publication/273256828\\_Assessing\\_the\\_Awareness\\_Knowledge\\_Attitude\\_and\\_Practice\\_of\\_the\\_Community\\_towards\\_Solid\\_Waste\\_Disposal\\_and\\_Identifying\\_the\\_Threats\\_and\\_Extent\\_of\\_Bacteria\\_in\\_the\\_Solid\\_Waste\\_Disposal\\_Sites\\_in\\_Morogoro\\_M/links/54fc381d0cf20700c5e965d3.pdf](https://www.researchgate.net/profile/Augustino_Chengula/publication/273256828_Assessing_the_Awareness_Knowledge_Attitude_and_Practice_of_the_Community_towards_Solid_Waste_Disposal_and_Identifying_the_Threats_and_Extent_of_Bacteria_in_the_Solid_Waste_Disposal_Sites_in_Morogoro_M/links/54fc381d0cf20700c5e965d3.pdf) Date Accessed: 07/12/2015
- Black, B.G. (1990). Public Participation in Waste Management. Paper read at the 10 th Biennial Congress, International Conference on Waste Management in the Nineties. Tenth Congress: Institute of Waste Management of Southern Africa. Port Elizabeth, 16-18 Oct. 1990 pp258-265. 404p.
- Boadi K, Kuitunene M. Municipal Solid Waste Management in the Accra Metropolitan Area, Ghana. *The Environmentalist*. 2003; 23: p. 211-218, 2003.
- Bolaane, B. (2006). Constraints to promoting people centred approaches in recycling. *Habitat International*, 30(4), 731-740.



David, A., 2016, 30 dramatic photos as Accra sinks in floods again. Available: <http://www.myjoyonline.com/news/2016/June-9th/30-dramatic-photos-as-accra-sinks-in-floods-again.php> Date Accessed: 30/09/2016

EU Waste Directive 2008, Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. Available: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098> Date Accessed: 31/11/2016

Gombya, S.W., and Mukunya, F., 2000, Solid Waste Management in Kawempe Division: Issues, Challenges and Emerging Options,

Hoornweg, D. and L. Thomas. 1999. What a Waste: Solid Waste Management in Asia. East Asia and Pacific Region. Urban and Local Government Working Paper. World Bank. Available: <http://web.mit.edu/urbanupgrading/urbanenvironment/resources/references/pdfs/WhatAWasteAsia.pdf> Date Accessed: 15/11/2016

Hoornweg, D., and Bhada-Tata, P., 2012, WHAT A WASTE A Global Review of Solid Waste Management, Urban Development Series Knowledge paper, World Banks. Available: [http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1334852610766/What\\_a\\_Waste2012\\_Final.pdf](http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1334852610766/What_a_Waste2012_Final.pdf) Date Accessed: 20/08/2016

Jayashree Sreenivasan, Marthandan Govindan, Malarvizhi Chinnasami and Indrakaran Kadiresu (2012). Solid Waste Management in Malaysia – A Move Towards Sustainability, Waste Management - An Integrated Vision, Dr. Luis Fernando Marmolejo Rebellon (Ed.), InTech, DOI: 10.5772/50870. Available from: <http://www.intechopen.com/books/waste-management-an-integrated-vision/solid-waste-management-in-malaysia-a-move-towards-sustainability> Date Accessed: 12/07/2016

Lamond, J., Bhattacharya, N., Bloch, R., 2012, The role of solid waste management as a response to urban flood risk in developing countries, a case study analysis, UK.

Laurent B. and Fabio L., 1997, The Legal Definition of Waste and its Impact on Waste Management in Europe, European Commission - Joint Research Centre Institute for Prospective Technological Studies WTC, Isla de la Cartuja s/n E-41092 Sevilla Spain

Lumbreras Martín, J., and Fernández García, L. (2014). Comprehensive solid waste management: The Ciudad Saludable model in Peru. Available:

<http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=39168981>. Date Accessed: 19/08/2016

Lutui, V., 2001, Waste management practices, perceptions and attitudes in Tonga. University of Wollongong

McAllister, Jessica, "Factors Influencing Solid-Waste Management in the Developing World" (2015). All Graduate Plan B and other Reports. Paper 528. Available:

<http://digitalcommons.usu.edu/cgi/viewcontent.cgi?article=1537&context=gradreports> Accessed: 18/11/2016

Moeller, D. W. (2005). Environmental Health (3rd ed.). Cambridge, MA:Harvard University Press.

Morrison, J., Wray, R., Dever, S., and Dunstan, L., 2000, workshop on waste management for Developing Countries. University of Wollongong, Australia.

Mungure, J.M., 2008, Governance and community participation in Municipal Solid Waste management, case of Arusha and Dar es Salaam Tanzania.

Poswa T.T., 2001, A Comparison of Attitudes Towards and Practices of Waste Management in Three Different Socio-economic Residential Areas of Umtata. Available: [http://www.academia.edu/6765739/A Comparison of Attitudes Towards and Practices of Waste Management in Three Different Socio-economic Residential Areas of Umtata](http://www.academia.edu/6765739/A_Comparison_of_Attitudes_Towards_and_Practices_of_Waste_Management_in_Three_Different_Socio-economic_Residential_Areas_of_Umtata) Date Accessed: 15/07/2016

Sam. P.A, 2009, Are the Municipal Solid Waste. Management Practices Causing Flooding During the Rainy Season in Accra, Ghana, West Africa. Available:

<https://www.modernghana.com/news/223779/1/are-the-municipal-solid-waste-management-practices.html> Date Accessed: 09/07/2016

Sanitation-Ghana, 2014, SANITATION COUNTRY PROFILE GHANA. Available:

<http://www.un.org/esa/agenda21/natlinfo/countr/ghana/SanitationGHANA04F.pdf> Accessed: 12/08/2016

Scarlett, L and Shaw, J.S. (1999). Environmental Process: What Every Executive Should Know. Perc Policy Series. Political Economy Research Center: Issues PS-15. April. 34p

Skarba, K. (1992). What a waste of money. Lantern, 41 (2): pp61-63 May

Southern California Conversion Technology (w.y.), Reducing Landfill Dependency  
<http://dpw.lacounty.gov/epd/SoCalConversion/About/Landfill>

Tchobanoglous, G., Theisen, H. and Vigil, S. (1993). Integrated Solid Waste: Engineering principles and management issues. McGraw-Hill Publishing Company, USA

UNEP/OCHA (2011). Rapid disaster waste management assessment: 26 October Flash Flooding, Central Accra, Ghana.

UN-Habitat, 2014, "Urbanisation Challenges, Waste Management, and Development". Available:  
[http://www.europarl.europa.eu/intcoop/acp/2014\\_mauritius/pdf/un\\_habitat\\_presentation\\_en.pdf](http://www.europarl.europa.eu/intcoop/acp/2014_mauritius/pdf/un_habitat_presentation_en.pdf)  
Accessed: 15/06/2016

UN-Habitat. 2009. Solid Waste Management in the World's Cities. Available:  
[http://www.sswm.info/sites/default/files/reference\\_attachments/UN%20HABITAT%202010%20Solid%20Waste%20Management%20in%20the%20Worlds%20Cities.pdf](http://www.sswm.info/sites/default/files/reference_attachments/UN%20HABITAT%202010%20Solid%20Waste%20Management%20in%20the%20Worlds%20Cities.pdf) Accessed: 23/07/2016

UN-HABITAT. (2010). Solid waste management in the world's cities. Nairobi: UNHABITAT, 2010. Available:  
[http://www.sswm.info/sites/default/files/reference\\_attachments/UN%20HABITAT%202010%20Solid%20Waste%20Management%20in%20the%20Worlds%20Cities.pdf](http://www.sswm.info/sites/default/files/reference_attachments/UN%20HABITAT%202010%20Solid%20Waste%20Management%20in%20the%20Worlds%20Cities.pdf) Accessed: 20/12/2016

United Nations Environment Programme, 2005, Solid Waste Management. Available:  
[http://www.unep.or.jp/ietc/publications/spc/solid\\_waste\\_management/Vol\\_I/Binder1.pdf](http://www.unep.or.jp/ietc/publications/spc/solid_waste_management/Vol_I/Binder1.pdf) Date Accessed: 18/06/2016

United Nations Environment Programme, 2013, Guidelines for National Waste Management Strategies, Moving from Challenges to Opportunities.

United Nations Environment Programme, 2015, Global Waste Management Outlook. Available:  
<http://web.unep.org/ourplanet/september-2015/unep-publications/global-waste-management-outlook> Date Accessed: 05/06/2016

# APPENDIX I

## GENERAL INFORMATION

Name: ..... Community: .....

District/Municipality:  
.....

Gender: Male  Female

Age: .....

Educational Status: JHS  SHS  TERTIARY  NONE

Occupation .....

## SECTION A: KNOWLEDGE OF WASTE MANAGEMENT

Please, answer by ticking one of the following questions:

1. Waste papers, plastic bags, a piece of metal and wood, and cloths are not rubbish?  
YES  NO  NOT SURE
2. Does waste pollute the environment?  
YES  NO  NOT SURE
3. Can waste be a resource or not?  
YES  NO  NOT SURE
4. Can waste be sorted and recycled?  
YES  NO  NOT SURE
5. Dumping waste improperly can cause flooding?  
YES  NO  NOT SURE
6. Waste can be reduced to solve environmental problems by reusing plastic bags, bottles and paper etc? YES  NO  NOT SURE
7. Burning of generated waste causes effect on the environment?  
YES  NO  NOT SURE
8. Improper disposal of Waste can cause some diseases such as diarrhoea, typhoid, cholera etc?  
YES  NO  NOT SURE
9. Are there any adequate measures in the community to check waste issues?  
YES  NO  NOT SURE
10. Is it important for individual's to play a role in dealing with waste management related issues?  
YES  NO  NOT SURE

IF YES, What kind of role could an individual play?

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

**SECTION B: ATTITUDES TOWARDS WASTE MANAGEMENT**

Please, cycle one of the following to answer the questions:

Questions	1 Strongly Agree	2 Agree	3 Not Sure	4 Disagree	5 Strongly Disagree
Waste is anything without value	1	2	3	4	5
It's one of the environmental problems that needs immediately attention	1	2	3	4	5
I care about waste management (reduce, reuse, and recycle)	1	2	3	4	5
I feel comfortable about the way plastic waste is managed	1	2	3	4	5
Putting wastes into garbage containers is the responsibility of everybody	1	2	3	4	5
Practice of waste management is not important	1	2	3	4	5
I prefer buying plastic packaged stuffs to unpackaged stuffs	1	2	3	4	5
Reusing plastic bags for shopping is good for reducing waste	1	2	3	4	5
Reusing of plastic bottles for storing or as drinking water bottle can reduce waste	1	2	3	4	5
Picking plastic waste to sell for recycling can help to manage plastic waste	1	2	3	4	5

**SECTION C: PRACTICES TOWARDS WASTE MANAGEMENT**

Please, choose one of the followings (All the times, Most of the times, Sometimes, Never) to answer the question below:

1. I buy packaged stuffs .....
2. I dispose of my waste into garbage bins.....
3. I provide my own trash bin for use.....
4. I collect and burn my waste .....
5. I dump my waste in an unauthorized open place/area.....
6. I sort my waste before disposing off .....
7. I prefer the use of old plastic to buying new .....
8. I obey the laws covering waste management.....
9. I give a piece of advice to people who do not manage waste.....
10. I report to authorities when I notice any waste management issues .....

APPENDIX II

**QUESTIONNAIRE FOR INSTITUTIONS**

**Institution:**

.....

1. What do you think about the waste management in the coastal communities?  
.....  
.....  
.....
2. Is your institution helping to solve waste management problems?  
.....  
.....
3. What are some of the challenges in dealing with waste management?  
.....  
.....  
.....
4. What measures have your institution taken to deal with waste management?  
.....  
.....  
.....
5. Are the coastal communities involved in your decision-making concerning waste management?  
.....  
.....  
.....
6. What are some of the reasons that contribute to waste management problems in the coast?  
.....  
.....  
.....
7. How does waste management in the coast affect the environment?  
.....  
.....  
.....
8. What do you think the government should be doing?  
.....  
.....
9. How feasible is it to change habits to poor waste management?  
.....  
.....
10. What are your suggestions?  
.....  
.....

## APPENDIX III

### Country Classification According to Income

Lower Income (LI)	Lower Middle Income (LMI)	Upper Middle Income (UMI)	High Income (HI)
Chad	Bulgaria	Colombia	Barbados
Comoros	Cameroon	Costa Rica	Belgium
Congo, Dem. Rep.	Cape Verde	Cuba	Brunei Darussalam
Eritrea	China	Dominica	Canada
Ethiopia	Congo, Rep.	Dominican Republic	Croatia
Gambia	Cote d'Ivoire	Fiji	Cyprus
Ghana	Ecuador	Gabon	Czech Republic
Guinea	Egypt, Arab Rep.	Georgia	Denmark
Haiti	El Salvador	Grenada	Estonia
Kenya	Guatemala	Jamaica	Finland
Lao PDR	Guyana	Latvia	France
Liberia	Honduras	Lebanon	Germany
Madagascar	India	Lithuania	Greece
Malawi	Indonesia	Malaysia	Hong Kong, China
Mali	Iran, Islamic Rep.	Mauritius	Hungary
Mauritania	Iraq	Mexico	Iceland
Mongolia	Jordan	Myanmar	Ireland
Mozambique	Lesotho	Namibia	Israel
Nepal	Macedonia, FYR	Panama	Italy
Niger	Maldives	Peru	Japan
Rwanda	Marshall Islands	Poland	Korea, South
Senegal	Morocco	Romania	Kuwait
Serbia	Nicaragua	Russian Federation	Luxembourg
Sierra Leone	Nigeria	Seychelles	Macao, China
Tanzania	Pakistan	South Africa	Malta
Togo	Paraguay	St. Kitts and Nevis	Monaco
Uganda	Philippines	St. Lucia	Netherlands
Vanuatu	Sao Tome and Principe	St. Vincent and the Grenadines	New Zealand
Vietnam	Solomon Islands	Suriname	Norway
Zambia	Sri Lanka	Tajikistan	Oman
Zimbabwe	Sudan	Uruguay	Portugal
	Swaziland	Venezuela, RB	Qatar
	Syrian Arab Republic		Saudi Arabia
	Thailand		Singapore
	Tonga		Slovak Republic
	Tunisia		Slovenia
	Turkey		Spain
	Turkmenistan		Sweden
	West Bank and Gaza		Switzerland
			Trinidad and Tobago
			United Arab Emirates
			United Kingdom
			United States