

**UNIVERSITY OF EDUCATION, WINNEBA  
COLLEGE OF TECHNOLOGY EDUCATION – KUMASI  
SCHOOL OF GRADUATE STUDIES**

**ASSESSING THE WASTE MANAGEMENT PRACTICES OF THE  
HOSPITALITY INDUSTRY: A CASE STUDY OF AHENFIE HOTEL,  
BEREKUM MUNICIPALITY**



**AGYEMANG ELLEN ASANTE**

**2020**



**UNIVERSITY OF EDUCATION, WINNEBA  
COLLEGE OF TECHNOLOGY EDUCATION – KUMASI  
SCHOOL OF GRADUATE STUDIES**

**ASSESSING THE WASTE MANAGEMENT PRACTICES OF THE  
HOSPITALITY INDUSTRY: A CASE STUDY OF AHENFIE HOTEL,  
BEREKUM MUNICIPALITY**



**AGYEMANG ELLEN ASANTE  
(190000386)**

**A Dissertation Submitted to the Department of HOSPITALITY AND TOURISM  
EDUCATION, Faculty of VOCATIONAL EDUCATION, School of research and  
Graduate Studies, University of Education, Winneba in Partial Fulfilment of the  
Requirements for the award of Master of Technology Education (Catering and  
Hospitality) M-Tech**

**SEPTEMBER, 2020**

## DECLARATION

### STUDENT'S DECLARATION

I, **Agyemang Ellen Asante**, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE:..... DATE:.....

**STUDENT'S DECLARATION: AGYEMANG ELLEN ASANTE**



### SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis/dissertation/project as laid down by the University of Education, Winneba.

SIGNATURE:..... DATE:.....

**SUPERVISOR'S NAME: DR. MRS. ELLEN OLU**

## **DEDICATION**

This research is dedicated to my husband Patrick Aninng Asubonteng and my children Laura Adubea Asubonteng, Eugene Asare Asubonteng, Jerome Asante Asubonteng and all my love ones.



## ACKNOWLEDGEMENT

All thanks and praises are due to God Almighty my maker and redeemer for his care, protection, guidance, good health and wisdom throughout my programme. My in-depth gratitude goes to my supervisor; Dr. Ellen Olu whose guidance, advice and encouragement has brought me and this research piece to a successful end.

My sincere gratitude is expressed to my husband Patrick Aninng Asubonteng and my children Laura Adubea Asubonteng, Eugene Asare Asubonteng, Jerome Asante Asubonteng and all my love ones for their support and cooperation.



## TABLE OF CONTENTS

<i>CONTENTS</i>	<i>PAGE</i>
DECLARATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENT.....	iv
TABLE OF CONTENTS .....	v
LIST OF TABLES.....	viii
LIST OF FIGURES .....	ix
ABSTRACT .....	<b>Error! Bookmark not defined.</b>
<b>CHAPTER ONE .....</b>	<b>Error! Bookmark not defined.</b>
1.1 Introduction.....	<b>Error! Bookmark not defined.</b>
1.2 Background of the Study .....	<b>Error! Bookmark not defined.</b>
1.3 Problem Statement.....	<b>Error! Bookmark not defined.</b>
1.4 Objectives of the Study.....	<b>Error! Bookmark not defined.</b>
1.5 Specific Objectives .....	<b>Error! Bookmark not defined.</b>
1.6 Research Question .....	<b>Error! Bookmark not defined.</b>
1.7 Justification of the Study .....	<b>Error! Bookmark not defined.</b>
1.8 Scope of the Study .....	<b>Error! Bookmark not defined.</b>
1.9 Organization of the Study.....	<b>Error! Bookmark not defined.</b>
<b>CHAPTER TWO .....</b>	<b>Error! Bookmark not defined.</b>
<b>LITERATURE REVIEW .....</b>	<b>Error! Bookmark not defined.</b>
2.1 Introduction.....	<b>Error! Bookmark not defined.</b>
2.2 Waste .....	<b>Error! Bookmark not defined.</b>
2.2.1 Sources and Types of Waste.....	<b>Error! Bookmark not defined.</b>
2.2.2 Components of Waste.....	<b>Error! Bookmark not defined.</b>
2.3 Waste Management .....	<b>Error! Bookmark not defined.</b>
2.3.1 Waste Management Processes .....	<b>Error! Bookmark not defined.</b>
2.4 Waste Generation.....	<b>Error! Bookmark not defined.</b>
2.4.1 Storage .....	<b>Error! Bookmark not defined.</b>
2.4.2 Collection.....	<b>Error! Bookmark not defined.</b>
2.4.3 Transfer and Transport .....	<b>Error! Bookmark not defined.</b>

2.4.4 Processing and Recovery'	.....	<b>Error! Bookmark not defined.</b>
2.4.5 Disposal	.....	<b>Error! Bookmark not defined.</b>
2.5 Contemporary Methods of Managing Solid Waste	....	<b>Error! Bookmark not defined.</b>
2.5.1 Source Reduction	.....	<b>Error! Bookmark not defined.</b>
2.5.2 Sanitary Landfill	.....	<b>Error! Bookmark not defined.</b>
2.5.3 Recycling	.....	<b>Error! Bookmark not defined.</b>
2.5.4 Composting	.....	<b>Error! Bookmark not defined.</b>
2.5.5 Incineration	.....	<b>Error! Bookmark not defined.</b>
2.6 Problems of Managing Waste	.....	<b>Error! Bookmark not defined.</b>
2.6.1 Technical Constraints	.....	<b>Error! Bookmark not defined.</b>
2.6.2 Financial Constraints	.....	<b>Error! Bookmark not defined.</b>
2.6.3 Institutional Constraints	.....	<b>Error! Bookmark not defined.</b>
2.7 Waste Management in Ghana	.....	<b>Error! Bookmark not defined.</b>
2.7.1 Waste Generation	.....	<b>Error! Bookmark not defined.</b>
2.7.2 Problems of Waste Management	.....	<b>Error! Bookmark not defined.</b>
2.7.3 Solid waste management in the hospitality industry		<b>Error! Bookmark not defined.</b>
2.7.4 Waste minimization in the hospitality industry	.....	<b>Error! Bookmark not defined.</b>
3.0 Introduction	.....	<b>Error! Bookmark not defined.</b>
3.1 Study Area	.....	<b>Error! Bookmark not defined.</b>
3.2 Research Design	.....	<b>Error! Bookmark not defined.</b>
3.3. Population of the Study	.....	<b>Error! Bookmark not defined.</b>
3.4 Sampling Techniques	.....	<b>Error! Bookmark not defined.</b>
3.5 Data Collection	.....	<b>Error! Bookmark not defined.</b>
3.5.1 Types of Data	.....	<b>Error! Bookmark not defined.</b>
2.6 Data analysis	.....	<b>Error! Bookmark not defined.</b>
<b>CHAPTER FOUR</b>	.....	<b>Error! Bookmark not defined.</b>
<b>PRESENTATION OF DATA, ANALYSIS AND DISCUSSIONS</b>	....	<b>Error! Bookmark not defined.</b>
		not defined.
4.1 Introduction	.....	<b>Error! Bookmark not defined.</b>
4.2 Demographic Characteristics of Respondents	.....	<b>Error! Bookmark not defined.</b>
4.3 Waste Category/Nature of Waste Generation	.....	<b>Error! Bookmark not defined.</b>
4.4 Waste Management Plan	.....	<b>Error! Bookmark not defined.</b>



4.5 Regulatory and Safety Issues..... **Error! Bookmark not defined.**

4.6 Challenges of Waste Management Practices..... **Error! Bookmark not defined.**

**CHAPTER FIVE** ..... **Error! Bookmark not defined.**

**SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS****Error!**  
Bookmark not defined.

5.0 Introduction..... **Error! Bookmark not defined.**

5.1 Summary..... **Error! Bookmark not defined.**

5.2 Summary of Findings ..... **Error! Bookmark not defined.**

5.3 Conclusions..... **Error! Bookmark not defined.**

5.4 Recommendations..... **Error! Bookmark not defined.**

5.5 Suggestions for Further Study ..... **Error! Bookmark not defined.**

REFERENCES ..... **Error! Bookmark not defined.**

APPENDIX I ..... **Error! Bookmark not defined.**



## LIST OF TABLES

<i>CONTENTS</i>	<i>PAGE</i>
Table 2.1: Sources and types of Waste .....	<b>Error! Bookmark not defined.</b>
Table 4.1: Demographic Characteristics of Respondents	<b>Error! Bookmark not defined.</b>
Table 4.2: Department of Employees .....	<b>Error! Bookmark not defined.</b>
Table 4.3: Non Hazardous waste .....	<b>Error! Bookmark not defined.</b>
Table 4.4: Hazardous Waste .....	<b>Error! Bookmark not defined.</b>
Table 4.5 Location of Waste containers .....	<b>Error! Bookmark not defined.</b>
Table 4.6: Waste Management Practices.....	<b>Error! Bookmark not defined.</b>
Table 4.7: Waste Kept in Same Container.....	<b>Error! Bookmark not defined.</b>
Table 4.8: Documentations of waste collected.....	<b>Error! Bookmark not defined.</b>
Table 4.9: Waste Management training.....	<b>Error! Bookmark not defined.</b>
Table 4.11: Challenges of Waste Management.....	<b>Error! Bookmark not defined.</b>

## LIST OF FIGURES

<i>CONTENTS</i>	<i>PAGE</i>
Figure 4.1: Category of Waste.....	<b>Error! Bookmark not defined.</b>
Figure 4.2: Management of Waste Bins .....	<b>Error! Bookmark not defined.</b>
Figure 4.3: Frequency of collecting.....	<b>Error! Bookmark not defined.</b>
Figure 4.4: Injury Experienced Source:.....	<b>Error! Bookmark not defined.</b>
Figure 4.5: Happy with waste management .....	<b>Error! Bookmark not defined.</b>
Figure 4.7: Rate of Overflow .....	<b>Error! Bookmark not defined.</b>



## ABSTRACT

The main objective of the study was to assess the waste management practices in hospitality industry services in the Berekum Municipality. Quantitative research approach was used. The population was made up of 25 staff at the hotel. The simple random sampling technique was used to sample the 20 staff members of the Ahenfie Hotel. Questionnaires were the main instrument used to gather primary data. Descriptive statistics was used to analyse data. The study results indicate that 85% of the respondents indicated that the non hazardous waste generated in the hotel were food and kitchen waste leftovers, used or dirty papers and wrapping, plastic wrapping or bags, cardboard packaging, printed documents, brochures, menus, magazines, newspapers, bags, bottles (that did not contain hazardous chemicals), and food containers. Moreover, 15% said that common potential hazardous wastes generated specifically include, polishes (used on the floor, metal, shoes and furniture), cleaning and disinfecting products (carpet and oven cleaners, detergent, bleach, spot removers and pool chemicals). The study shows that staff's roles as waste managers in the hotel is to regulate activities such as cleaning, weeding, washing and smoking that can lead to hazardous conditions (mean score of 4.87, SD - 0.67), properly control waste (mean score of 4.83, SD - 0.69), weed and control grass and bush (mean score of 4.76, SD - 0.75), maintaining operational tidiness and order (mean score of 4.54, SD - 0.78), and handle materials well and store them properly (mean score of 4.52, SD - 0.83). The study concluded that the hotel does not document the quantity of waste generated and the employees are not trained on how to manage waste. Again, the persons responsible for managing waste do not have adequate personal protective equipments. The study recommended that the Management of the hotel should organize periodic workshops, seminars and conferences to enhance the knowledge and practical expertise of waste management supervisors to improve hygiene and cleanliness

initiatives in the hotel.





## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Waste is any material which comes from domestic, commercial, and industrial sources arising from human activities which has no value to people who possess it and is discarded as useless (Shafiul & Mansoor, 2003). In the early days, waste disposal did not pose difficulty as habitations were sparse and land was plentiful. Waste disposal became problematic with the rise of towns and cities where large numbers of people started to congregate in relatively small areas in pursuit of livelihoods (Shafiul and Mansoor, 2003). While the population densities in urbanized areas and per capita waste generation increased, the available land for waste disposal decreased proportionately.

The management of wastes all over the world especially, in developing countries like Ghana, is a major challenge due to its associated environmental and health implications. Even though there are problems associated with the management of residential, commercial, municipal, agricultural as well as construction and demolition of solid and liquid wastes; institutional wastes like hospitality industry waste is not an exception and needs to be considered more seriously. Improper management of hospitality industry waste can pollute the air, land and water sources leading to serious health implications on humans, animals and other living things. The infectious and hazardous nature of hospitality industry waste makes it necessary to manage or handle such wastes with care and tact (Riyaz et al., 2010). Mismanaging hospitality industry waste can have serious health implications to waste handlers (workers), hospitality workers like; Caterers, Waiters, laundry hands, groundkeepers, supporting staffs as well as customers, waste scavengers and the general populace as a whole. Studies have shown that a high

percentage of workers who handle wastes and individuals who live near disposal sites are infected with gastrointestinal parasites, and other diseases like; cholera, yellow fever and salmonellosis (Fei-Baffoe, 2010).

The increase in the number of hotels restaurants and other hospitality related institutions has, undoubtedly and unavoidably, resulted in an increase in the quantum of hospitality industry waste generation. According to the World Health Organization (WHO, 2008), hazardous wastes deal with infectious, radioactive or toxic materials coming out of bodily structures of animals, object with sharp edges, pharmaceuticals, genotoxic waste as well as heavy metals. Non-hazardous waste is related to waste generated from administration, compounds and the cafeteria/kitchen. Most wastes generated in the various hospitality industry' are non-infectious but few are infectious and hazardous.

Disposal of hospitality industry waste has emerged as a major problem in the country. The public is increasingly concerned over the improper disposal of hospitality' industry' wastes, particularly, the wastes contaminated with communicable disease agents. The hospitality industry' in many parts of the world is expected to see significant rates of growth in the next few years. Indeed, while exploring the various literature concerning the global outlook for the hospitality industry, it is clear that, in most pans of the world, this sector is recovering from its financial losses after the 2008 global economic crisis and a positive outlook and favorable transaction climate are anticipated in 2014 for the global lodging industry (Fishbin, 2014).

This expansion in hospitality' industry' operations is complemented by an expansion in its waste management operations. More waste usually translates into a greater environmental footprint and therefore more harm to the ecosystem (International Hotel Environmental Initiative, 2002). As a result, waste management processes adopted



by many hotels and restaurants have changed from what they were 15 years ago and various waste reduction strategies are being implemented, including those which address food waste.

In fact, with effective waste management, a mid-size hotel can produce one-fourth the waste generated by a similar hotel which is not implementing the same waste management strategies. For a hospitality business, the cost of solid waste management includes various factors such as the disposal and transport of waste, as well as associated labor costs (Todd & Hawkins, 2003). Therefore, more efficient waste management can help lead to significant savings for the business depending on where the business is located and the waste management regulations in that area. Other benefits of ecofriendly waste management include an improved business image, reduced carbon emissions from the decreased transportation of waste, reduced costs due to smaller order requirements from suppliers, improved relations with stakeholders, reduced risks and liabilities, and health and safety benefits (Ball & Abou Taleb, 2010).

The hospitality industry' is one of the world's largest and fastest growing industries and since travel for purposes of tourism is synonymous with an overnight stay in hotels, waste management in hotels is key and obviously an important step towards achieving sustainable environmental development. In Ghana, the hospitality industry is growing at a rate of about 3.5% per annum and the hotel sector in general has experienced a rapid growth in response to the growing opportunities offered by prudent macro-economic policies. African Development Bank's study on waste management in 2002 opines that Ghana generates about 3.6 million tons of solid waste per year which are mainly organic compostable such as food, yard and wood wastes as well as paper, plastic, glass and metal.

Also, according to BMA (2013), the current domestic waste generation in Berekum rate was approximately between 300-500 tonnes a day. This was based on the

projected population of 129,683. According to Ketibuah et al (2010); in Kumasi the bulk of household waste is found to be organic waste which includes food waste and pustrecible waste with an average of 55 per cent. Ghana like other developing countries has over the years had difficulties in waste management with regards to infrastructural and technical inefficiencies.

The impact of poor waste management in cities in Ghana threaten the achievement of the Millennium Development Goals (MDGs) especially the MDG 7 ([insuring Environmental Sustainability) as well as poverty eradication which are being prioritized by the government in national issues. Among these impacts are revenue leakages, air, noise and water pollution, degradation and depletion of natural resources, biodiversity loss, energy problems and social vices, encroachment and its accompanying problems, cultural and heritage related problems such as pseudo arts and cultural shock, sewage disposal problems among others, therefore the need to investigate the waste management practices of the institutions in the hospitality industry.

## **1.2 Problem Statement**

Waste management is one of the greatest environmental challenges confronting cities in developing countries. It is one of the most pervasive environmental problems which constantly engage the attention of policymakers, city administrators, and academia. According to a report commissioned by the World Bank, by 2050, 3.40 billion tons of waste will be generated around the world annually, increasing drastically from today's 2.01 billion tons (Kaza, Yao, Bhada-Tata, & Van Woerden, 2018). The cost of managing tons of waste generated on a daily basis in cities, coupled with the scarcity of landfill sites, has been a major cause for concern.

It is an undeniable fact that hotels impact adversely on the environment through the generation of solid and liquid waste, emission of dangerous chemicals, and pollution of the atmosphere (Chan & Lam, 2012). According to Al-Aomar and Hussain (2018), waste across hotel supply chains is growing. Disastrous environmental consequences are bound to occur when wastes are not properly managed. Such wastes could pollute water, land, and air as well as create unsightly conditions. Unscientific and improper waste treatment affects society and damages the environment (Dileep, 2017).

Landfilling, which is the least favored waste management option, results in the greatest impact on the environment. Ironically, that is the commonest waste management practice undertaken by hotels (Radwan et al., 2012). In a study on solid waste management by hotels in Tunisia, Chaabane, Nassour, and Nelles (2018) found that 83% of hotels generated mixed waste which was sent to the landfill, whereas only 17% of hotels had developed small recycling and composting initiatives. Landfill resulting from wastes from hotels contributes to the degradation of the environment through the pollution of groundwater through the creation of *leachate* and the emission of explosive gases like methane (Becklake, 2011). The practice of waste disposal at landfill sites is contrary to the fact that waste management practices have evolved from reduction of the environmental impacts of waste through the creation of landfill sites to resource recovery (Read, 2013). Berekum Municipality is a bustling commercial centre with all the trappings of urbanization, including a growing population, proliferation of infrastructure and superstructure, traffic congestion, and pollution. One of the unavoidable challenges associated with urbanization is the generation of wastes. Berekum Municipality generates an estimated 1,000 metric tons of waste per day, of which about 30% remain uncollected (Today Newspaper, 2020). City authorities have been grappling with the problem of collecting heaps of garbage in various parts of the city. The lack of landfill sites has further

compounded the problem, as city authorities have been hampered by the land tenure system of the country in the acquisition of land to build landfills and waste treatment centres.

### **1.3 Objectives of the Study**

The main objective of the study sought to assess the waste management practices in hospitality industry services in the Berekum Municipality.

### **1.4 Specific Objectives**

To achieve the main objective, the study was limited to the following specific objectives;

1. To identify the waste management practices of the Ahenfie hotel in Berekum Municipality.
2. To assess the methods used by Ahenfie Hotel to deal with the waste they generate.
3. To analyze problems faced by the hotel in managing waste in the Berekum Municipality?

### **1.5 Research Question**

1. What are the waste management practices of the Ahenfie hotel in Berekum Municipality?
2. What are the methods used by Ahenfie Hotel to deal with the waste they generate?
3. What are the problems Ahenfie Hotel faces in managing waste in the Berekum Municipality?

## 1.6 Justification of the Study

As in other developing countries, increase in population has resulted in increase in waste generation. The result is the generation of refuse dumps close to residential areas, posing severe health and environmental problems. There is difficulty in clearing wastes in the city due to lack of equipment. Some use can be made of the biodegradable component of waste generated. This study was therefore justified to reduce the amount of waste being generated by hospitality industry services providers, in order to reduce some of the waste reaching landfill sites. It is expected that through implementation of recommendations from the study, the amount of waste that gets to refuse dumps in Berekum municipality and hence landfill sites would be greatly reduced through proper waste management practices in the industry.

Service providers in the industry' would be able to make some extra income by selling recyclable and reusable components of the wastes they generate, and also be able to use composted organic wastes as manure for backyard gardens. Proper waste management practices would also limit the effect of land pollution and areas around refuse dumps would be cleaner and odour free. Again, despite the immensity of the problem, very little research on waste management in the hospitality industry has been carried out in the country. The study will serve as a reference point to the Municipal Assembly and waste management institutions as far as waste management is concerned. In this case, it will give them an in-depth understanding of what the problems of poor waste management are and the strategies to tackle the problems. Additionally, the study will contribute to existing body of knowledge on solid waste management and also stimulates further research on the subject in other Municipalities.

### **1.7 Scope of the Study**

Geographically, the study area covered Berekum Municipality in the Brong Ahafo Region of Ghana. Berekum Municipality was chosen because it is a growing city just like other Municipalities such as Techiman and Sunyani and as such is facing a bigger problem of managing its waste effectively. Contextually, the study focused on Ahenfie hotel's waste management practice.

### **1.8 Organization of the Study**

This study is organized into five main chapters. Chapter one presents the background to the study, statement of the problems and objectives of the study. It also outlines the research questions and the significance of the study. The second chapter reviews the relevant literature on theories, concepts and issues of the study. It also presents the summary of the theoretical underpinnings, the research objectives and empirical reviews. Chapter 3 outlines the methodology of the study, methodological issues considered here include approach (es) to the research, the research design, study population, sampling procedures, data collection and processing. Other considerations are statistical procedures and data analyses. Chapter 4 presents results or findings of the study. This section features an in-depth discussion of findings and their implications. The fifth and final Chapter is devoted to summary, conclusion and recommendations based on the findings of the study. Suggested areas for further research are also included.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

In the quest for development, Ghanaians did not budget for the problems related to the management of waste. This chapter therefore explores literature on waste management. It examines key concepts, methods and problems of waste management. The chapter concludes with the summary of key lessons learnt from the review and a conceptual framework that guides the study.

#### **2.2 Waste**

Waste is more easily recognized than defined. Something can become waste when it is no longer useful to the owner or it is used and fails to fulfill its purpose (Freduah, 2004). There are basically two types of waste namely liquid and solid waste. Much has been written about the waste problem yet the definition of the term waste is quite rare in the scholarly literature on the topic. As noted by Palmer (2005) the term is frequently left as an undefined primitive in spite of its critical importance and frequently, a list of types of waste is substituted for the underlying definition. The Longman Dictionary of Contemporary English defines waste as the unwanted material or substance that is left after you have used something.

According to Gilpin (1996), the concept of waste embraces all unwanted and economically unusable byproducts or residuals at any given place and time, and any other matter that may be discarded accidentally or otherwise into the environment. Gilpin also suggests that what constitutes waste must occur in such a volume, concentration, constituency or manner as to cause a significant alteration in the environment. Thus, apart

from waste being an unwanted substance that is discarded, the amount of it and the impact it makes on the environment also become important considerations in defining waste.

Jessen (2002) noted that waste is human creation and there is no such thing as waste in nature where cut-offs of one species become food for another. Davies (2008) also describes wastes unwanted or unusable materials that emanate from numerous sources from industry and agriculture as well as businesses and households and can be liquid, solid or gaseous in nature, and hazardous or non-hazardous depending on its location and concentration (Davies, 2008).

### 2.2.1 Sources and Types of Waste

Tchobanoglous *et al* (1993), classified types of solid waste in relation to the sources and generation facilities, activities, or locations associated with each type which is presented in table 2.1 below.

**Table 2.1: Sources and types of Waste**

Source	Typical Location	Type of waste
<b>Residential</b>	Single-family and multifamily dwellings, low-medium, and high-rise	Food wastes, rubbish, ashes, special wastes
<b>Commercial</b>	Stores, restaurants, markets, office buildings, hotels, motels, print shops, auto repair shops, medical facilities	Food wastes, rubbish, ashes, demolition and construction wastes, special wastes,
<b>Industrial</b>	Construction, fabrication, light and heavy manufacturing, refineries, chemical plants, lumbering, mining,	Food wastes, rubbish, ashes, demolition and construction wastes, special * wastes,



---

<b>Open Areas</b>	Streets, alleys, parks, vacant plots, playgrounds, beaches, highway and recreational areas.	Special wastes, rubbish
<b>Treatment plants Sites</b>	Water, wastes water, and industrial treatment processes.	Treatment plant wastes, principally composed of residual
<b>Agricultural</b>	Field and row crops, orchards, vineyards, dairies, feedlots and farms.	Spoiled food wastes, agricultural wastes, rubbish, hazardous wastes

---

Source: Zein, Wazner, & Meylan, 2008

Tchobanoglous *et al* (1993) has further explained the types of solid waste which include food waste, rubbish, ashes and residues and special waste. These are explained below.

*Food waste:* Food wastes are all the animal, plant or vegetable residues resulting from the handling, preparation, cooking, and eating of foods (also called garbage). The most important characteristics of these waste is that they are highly putrescible and will decompose rapidly, especially in warm weather. Often, decomposition will lead to the development of offensive odors. In many locations, the putrescible nature of these wastes will significantly influence the design and operations of solid waste collection.

*Rubbish:* Rubbish consists of combustible and non- combustible solid wastes of households, institutions and commercial activities. This excludes food wastes or other highly putrescible materials. Typically, combustible rubbish consists of materials such as paper, cardboard, plastics, textiles, rubber, leather, wood, furniture, and garden trimmings. Non-combustible rubbish consists of glass, tin cans, aluminium cans, ferrous and other non-ferrous metals, and dirt.

*Ashes and Residues:* These are materials remaining from the burning of wood, coal, coke and other combustible wastes in homes, stores, institutions, and industrial and

municipal facilities for purposes of heating, cooking and disposing of combustible wastes. These are referred to as ashes and residues.

*Special waste:* Special waste includes street sweepings, roadside litter, and litter from municipal containers, catch-basin debris, dead animals and abandoned vehicles.

The Centre for Environment and Development (2003) has also classified types of solid waste based on origin (food waste, rubbish, ashes and residues, demolition and construction, agriculture waste), based on characteristics (biodegradable and non-biodegradable), based on the risk potential (hazardous waste). The Centre also enumerated sources of solid waste as residential, waste from shops, commercial establishments, hotels/restaurants/eating stalls, slaughter houses and others.

This has confirmed the sources and types of solid waste outlined by Tchobanoglous *et al* (1993). Based on the types of solid waste enumerated by Tchobanoglous *et al* (1993) and the Centre for Environment and Development (2003), it can be said that types of solid waste include the following, food waste, rubbish, ashes and residues, demolition and construction, and agriculture waste. The sources of solid waste also include domestic, commercial and industrial.

### **2.2.2 Components of Waste**

Solid waste consists of many different materials. Some can burn, some cannot. Some can be recycled, some cannot. Therefore, a detailed understanding of the composition of solid waste will indicate the management methods that will be used. Solid waste is composed of combustibles and non-combustible materials. The combustible materials include paper, plastics, yard debris, food waste, wood, textiles, disposable diapers, and other organics. Noncombustibles also include glass, metal, bones, leather and aluminium (Denison and Ruston 1990; Kreith 1994 and Zerbock 2003).

## 2.3 Waste Management

The term solid waste management has been viewed differently by various authors. Kumah (2007) defines solid waste management as “the administration of activities that provide for the collection, source separation, storage, transportation, transfer, processing, treatment, and disposal of waste. However, Tchobanoglous et al (1993: 7), provide a more comprehensive definition of solid waste management. They claimed solid waste management is that discipline associated with the control of generation, storage, collection, transfer and transport, processing and disposal of solid wastes in a manner that is in accordance with the best principles of public health, economics, engineering, conservation, aesthetics and other environmental considerations and that is also responsive to public attitudes.

Therefore, if solid waste management is to be accomplished in an efficient and orderly manner, the fundamental aspects and relationships involved must be identified and understood clearly (Tchobanoglous *et al*, 1993 ). On the basis of this solid waste management incorporates the following: source separation, storage, collection, transportation and disposal of solid waste in an environmentally sustainable manner.

### 2.3.1 Waste Management Processes

The key elements in solid waste management include: waste generation, storage, collection, transfer and transport, processing and recover} and final disposal. This means that when waste is generated it is first stored in either dustbins or skips. It is then collected and finally disposed of in landfill. Also, when waste is collected it can be transferred from small collection equipment like the tricycle to a bigger truck for final disposal. On the other hand, waste collected can be processed and recovered for materials to be reused.

## **2.4 Waste Generation**

Waste generation encompasses those activities in which materials are identified as no longer being of value and are either thrown away or gathered together for disposal (Momoh and Oladebeye, 2010). According to United Nation Environmental Programme (2016). in 2015 the total amount of municipal solid waste generated globally reached 3.778 billion tones, representing a 8 per cent annual increase since 2007 (UNEP, 2009). The programme also says that, as per WHO estimations, the total health-care waste per person per year in most low income countries, is anywhere from 0.5 kg to 3 kg. That notwithstanding, the causes of this increased should have enumerated by the organization and therefore, has not exhausted the issue on discussion. It is accepted that solid waste generation is increasing at a faster rate globally as indicated by UNEP and this is confirmed by Mensah and Larbi (2005) concerning solid waste generation in Ghana.

### **2.4.1 Storage**

Tchobanoglous *et al* (2017) explain storage to mean where solid waste is stored before it is collected. It could be stored in a skip or dustbins and not thrown away indiscriminately. According to them, storage is of primary importance because of the aesthetic consideration.

### **2.4.2 Collection**

The element of collection includes not only the gathering of solid waste, but also the hauling of waste after collection to the location where the collection vehicle is emptied (Kreith, 1994). According to Kreith (1994), the most common type of residential collection services in the United States include curb, setout-setback and backyard carry. According to the USPS (2000), in the city of Thimphu in Bhutan the collection of solid

waste from households, commercial set-ups was done in concrete receptacles placed at strategic points and conveyed by trucks/tractors.

Accordingly, there were concrete bins and containers provided at various locations from where the waste was lifted for disposal. Individual bins/containers were also placed alongside the shops in certain areas, which were emptied directly into the trucks/tippers. This prevents people from dumping waste indiscriminately.

### **2.4.3 Transfer and Transport**

According to Kreith (1994), transfer and transport involves two steps i.e. the transfer of wastes from the smaller collection vehicle to the larger transport equipment and the subsequent transport of the wastes, usually over long distances to the final disposal site.

### **2.4.4 Processing and Recovery'**

The element of processing and recovery' includes all the technology, equipment, and facilities used both to improve the efficiency of other functional elements and to recover usable materials, conversion products or energy from solid wastes (Tchobanoglous *et al* 2017). In the recovery, separation operations have been devised to recover valuable resources from the mixed solid wastes delivered to transfer stations or solid waste processing plants (Tchobanoglous *et al*, 2017).

### **2.4.5 Disposal**

It is the ultimate fate of all solid wastes whether they are residential wastes collected and transported directly to landfill site. Having explained the various elements in the diagram by some authorities, the next section analyses in further details the final

disposal methods of solid waste. Several methods of solid waste management have evolved over the years. These methods according to the Centre for Environment and Development (2003) vary greatly with types of wastes and local conditions. For the purpose of this analysis, this section is divided into early practices of managing solid waste and contemporary methods of waste management systems.

## **2.5 Contemporary Methods of Managing Solid Waste**

In the contemporary era, the methods of managing solid waste include source reduction, sanitary landfills, composting, recycling, and incineration (Denison & Ruston, 1990). These methods are examined below.

### **2.5.1 Source Reduction**

Denison and Ruston (1990) viewed source reduction as any action that reduces the volume or toxicity of solid waste prior to its processing and disposal in incinerators or landfills. This view is similar to the one given by Kreith (1994). According to him, source reduction focuses on reducing the volume and/or toxicity of waste generated. Source reduction includes the switch to reusable products and packaging, the most familiar example being returnable bottles. According to USPS (2000) in the city of Thimphu in Bhutan to reduce waste problems in future, reduction in waste generation would be the most important factor.

Examples of possible reduction at the consumption level include reuse of containers (including bags), better buying habits, and cutting down on the use of disposable products and packaging (USPS, 2000). It is agreed that, source separation and resource recovery is an important method in waste management. This is because there is nothing like waste on this earth. Wastes that are discharged may be of significant value in

another setting, but they are of little or no value to the possessor who wants to dispose of it.

According to Tsiboe and Marbel (2004), Austria, the Netherlands, and Denmark developed a waste management processes to efficiently resolve the waste disposal problem by essentially coaxing their citizens to separate their domestic solid waste into glass, paper, plastic categories; thereby enabling easy collection and consequently reuse. As suggested by the three authors, one way of effectively managing solid waste is to minimize solid waste generation through source reduction.

### **2.5.2 Sanitary Landfill**

Sanitary land filling includes confining the waste, compacting it and covering with soil. It not only prevents burning of garbage but also helps in reclamation of land for valuable use (Centre for Environment and Development. 2003). The placement of solid waste in landfills is the oldest and definitely the most prevalent form of ultimate waste disposal (Zerbock. 2003). He further argued that landfills are nothing more than open, sometimes controlled dumps. According to him the difference between landfills and dumps is the level of engineering, planning, and administration involved. Open dumps are characterized by the lack of engineering measures, no leachate management, no consideration of landfill gas management, and few, if any. operational measures such as registration of users, control of the number of tipping fronts or compaction of waste (Zerbock, 2003).

Furthermore, landfills are one form of waste management that nobody wants but everybody needs (Kreith, 1994) According to him, there are simply no combinations of waste management techniques that do not require landfilling to make them work. Of the basic management options of solid waste, landfills are the only management technique that is both necessary and sufficient. According to Kreith (1994) some wastes are simply not

recyclable, many recyclable wastes eventually reach a point where their intrinsic value is completely dissipated and they no longer can be recovered, and recycling itself produces residuals. He further highlighted that the technology and operation of modern land fill can assure the protection of human health and the environment.

In contrast to what the various authors have said about sanitary landfill as an option for waste management, they have failed to recognize that land fill in itself has some disadvantages as it is costly to construct and maintain, can pollute ground water through leaching, location is a problem in terms of availability of land particularly in the cities. Other critical factors such as gas recovery, composting, waste to energy recovery, storm water control, distance to any settlement and water body were not clearly spelt out by the authors. Therefore, there could be an alternative which is recycling.

The practice of waste disposal at landfill sites is contrary to the fact that waste management practices have evolved from reduction of the environmental impacts of waste through the creation of landfill sites to resource recovery (Read, 2013). This shift in focus of waste management falls within the paradigm of industrial ecology. Industrial ecology is concerned with the shifting of industrial process from linear (open loop) systems, in which resource and capital investments move through the system to become waste, to a closed loop system where wastes can become inputs for new processes (Basu & van Zyl, 2016). However, Rojo, Glaus, Hausler, Lafort, and Bourgeois (2013) posit that waste management should not only aim at reducing the volume of waste sent to incineration or landfills but must also optimize social acceptability, economic gain and environmental compatibility, while promoting a sustainable and fair society.

Thus, the major objective of waste management in hotels should be to reduce the amount of waste that is finally dispatched to landfill sites. To reduce waste, hotels must concurrently undertake bulk purchasing to reduce customers' consumption and packaging,



encourage the use of returnable containers and recycle materials such as glass and paper, as well as undertake selective rubbish collection, among other practices (Carmona-Moreno, Cespedes-Lorente, & Burgos-Jimenez, 2014).

In spite of this, many small hotels do not recycle their wastes (Chan & Lam, 2011; Dewhurst & Thomas, 2013; Radwan et al., 2010). In a study of small hotels in Turkey, Erdogan and Baris (2017) found that almost all hotels collect, store and place their waste in designated places for collection and disposal by garbage collectors. Only 21.2% of the hotels reused bottles and papers. Similarly, most of the hotels in the Greater Accra Region of Ghana did not have appropriate waste management and recycling programmes in place. As such, 34 out of the 52 sampled hotels (65%) mostly dumped their waste into garbage bins or sent them to waste disposal sites (Mensah, 2019).

In a related study in Lebanon, Ghadban et al. (2016) found that while all nine large hotels (hotels with more than 100 rooms) sampled were implementing solid waste management programmes, only three of the small hotels (hotels with less than 100 rooms) sampled were managing their waste by adopting recycling and re-using strategies. Management of many small hotels have very little interest in reducing and/or recycling waste, believing that such activities are too expensive and time-consuming (Chan & Lam, 2011).

In a study by Radwan et al. (2010), only a minority of small hotels were considering the adoption of sustainable solid waste management (SWM) practices, either because most hoteliers felt negatively about sustainable SWM alternatives or perceived challenges in their implementation. Generally, larger companies tend to be more proactive towards environmental management (Etzion, 2017).

Pham Phu, Hoang, and Fujiwara (2018), in a study on solid waste management practices of the hotel industry in Hoi An, Vietnam found that the higher the scale of a

hotel, the more the attention to solid waste management practices. Larger companies tend to enjoy economies of scale in the reuse, recycling, and recovery of waste. In the same vein, large hotel firms also tend to have idle resources, adopt a more formal approach to environmental management, and enjoy economies of scale on the use of wastes (Cespedes-Lorente, De Burgos- Jimenez, & Alvarez-Gil, 2013).

### **2.5.3 Recycling**

According to Momoh and Oladebeye (2010) recycling has been viewed as a veritable tool in minimizing the amount of household solid wastes that enter the dump sites. It also provides the needed raw materials for industries. According to them, it has been established that, it is the best, efficient and effective method of solid waste management system. However, this may not be cost effective in developing countries like Ghana. The United States Environmental Protection Agency (USEPA) (2009) has recommended recovery for recycling as one of the most effective waste management techniques.

According to USEPA, recycling turns materials that would otherwise become waste into valuable resources and, it yields environmental, financial, and social returns in natural resource conservation, energy conservation, pollution prevention, and economic expansion and competitiveness. More importantly, a sizeable portion of what is thrown away contains valuable resources - metals, glass, paper, wood, and plastic - that can be reprocessed and used again as raw materials (USEPA, 2009).

Kreith (1994) has also added that, recycling is the most positively perceived and doable of all the waste management options. According to him recycling will return raw materials to market by separating reusable products from the rest of the municipal waste stream. The benefits of recycling are many, he added. It saves precious finite resources.

lessens the need for mining of virgin materials which lowers the environmental impact for mining and processing. For example, according to the Institute of Waste Management cited by Tsiboe and Marbel (2004), IJK recycles only 11 per cent of its household waste, Italy and Spain only 3 per cent. Netherlands 43 per cent, Denmark 29 per cent, and Austria 50 per cent respectively. Having proposed recycling by different authors as the best option to manage solid waste in modern times: they have forgotten about the cost component which is key to successful implementation of any recycling project. Even developed countries are not able to successfully do it. But alternatively, it may be the best option for effectively managing solid waste in Ghana.

#### **2.5.4 Composting**

Composting process uses microorganisms to degrade the organic content of the waste. Aerobic composting proceeds at a higher rate and converts the heterogeneous organic waste materials into homogeneous and stable humus (Centre for Environment and Development. 2003). UNEP (2009) has also defined composting as a biological decomposition of biodegradable solid waste under controlled predominantly aerobic conditions to a state that is sufficiently stable for nuisance-free storage and handling and is satisfactorily matured for safe use in agriculture.

According to the UNEP (2009), composting is the option that, with few exceptions, best fits within the limited resources available in developing countries. A characteristic that renders composting especially suitable is its adaptability to a broad range of situations. According to Zerbock (2003), a low-technology approach to waste reduction is composting. He further says that in developing countries, the average city's municipal waste stream is over 50 per cent organic material.

### **2.5.5 Incineration**

According to the Centre for Environment and Development (2003), incineration is a controlled combustion process for burning combustible waste to gases and reducing it to a residue of non-combustible ingredients. According to the Centre, during incineration, moisture in the solid waste gets vapourised and the combustible portion gets oxidised and vapourised. ('02, water vapour, ash and non-combustible residue are the end products of incineration. Incinerators have the capacity to reduce the volume of waste drastically, up to nine fold than any other method (Kreith, 1994).

According to him incineration can also recover useful energy either in the form of steam or electricity. He however recognised that the main constraints of incineration are high cost of operation, relatively high degree of sophistication needed to operate them safely and economically as well as the tendency to pollute the environment through emissions of carbon dioxide. Having assessed the major methods that have been proposed by the various authors, literature has further revealed that there is an alternative method of managing solid waste effectively which is synonymous to waste reduction and recycling as mentioned earlier on. This forms the next section of the review.

### **2.6 Problems of Managing Waste**

According to Ogawa (2005), a typical solid waste management system in a developing country displays an array of problems, including low collection coverage and irregular collection services, crude open dumping and burning without air and water pollution control. He categorized these challenges into technical, financial, institutional and social constraints. He further discussed these constraints in relation to the sustainability of solid waste in developing countries.

### **2.6.1 Technical Constraints**

According to him, in most developing countries, there are inadequate human resources at both the national and local levels with technical expertise necessary for solid waste management planning and operation. Many officers in charge of solid waste management, particularly at the local level, have little or no technical background or training in engineering or management.

### **2.6.2 Financial Constraints**

Ogawa (2005) intimated that, solid waste management is given a very low priority in developing countries, except perhaps in capital and large cities. As a result, very limited funds are provided to the solid waste management sector by the governments, and the levels of services required for protection of public health and the environment are not attained. The problem is acute at the local government level where the local taxation system is inadequately developed and, therefore, the financial basis for public services, including solid waste management, is weak. This weak financial basis of local governments can be supplemented by the collection of user service charges. However, users' ability to pay for the services is very limited in poorer developing countries, and their willingness to pay for the services which are irregular and ineffective.

### **2.6.3 Institutional Constraints**

He indicates that, several agencies at the national level are usually involved at least partially in solid waste management. He however, indicated that, there are often no clear roles or functions of the various national agencies defined in relation to solid waste management and also no single agency or committee designated to coordinate their projects and activities.

According to him, Legislation (Public Health Act, Local Government Act, Environmental Protection Act) related to solid waste management in developing countries, is usually fragmented.

Zurbrugg (2009) further added that, solid waste collection schemes of cities in the developing world generally serve only a limited part of the urban population. The people remaining without waste collection services are usually the low-income population living in peri-urban areas. According to him, one of the main reasons is the lack of financial resources to cope with the increasing amount of generated waste produced by the rapidly growing cities. Often inadequate fees charged and insufficient funds from a central municipal budget cannot finance adequate levels of service.

He indicated that, apart from financial constraints that affect the availability or sustainability of a waste collection service; operational inefficiencies of solid waste sendees such as deficient management capacity of the institutions and inappropriate technologies affect effective waste management. Zurbrugg (2009) therefore underscores the key challenges of waste management which include financial and institutional constraints.

## **2.7 Waste Management in Ghana**

Over the years, solid waste disposal in Ghana has become a major challenge to MMDAs. As a result of urbanization and increasing densities, Metropolitan Assemblies find it difficult to deal with the large quantities of solid waste generated. This is due to the fact that, people resort to indiscriminate dumping as the only means to managing their domestic solid waste thus resulting in littering and heaping of waste. This section of the review analyses solid waste management processes in Ghana. These include collection and disposal as well as waste management regulation and policy in Ghana.

### **2.7.1 Waste Generation**

According to Mensah and Larbi (2005) based on an estimated population of 22 million and an average daily waste generation per capita of 0.45 kg, Ghana generates annually about 3.0 million tonnes of solid waste. Boateng and Nkrumah (2006) have further added that, solid waste generated daily in Accra was between 1500-1800 tonnes. According to Anomanyo (2004) about 1800 tonnes of municipal solid wastes were generated per day in the Accra Metropolis and the average waste generated per capita per day was estimated at 0.5 tonnes.

He attributed this to the rate of population growth in the Metropolis which stood at 3.5 per cent. Waste from domestic sources include, food waste, garden waste, sweepings, ash, packaging materials, textiles and electric and electronic waste with organic waste being the major component. This constituted about 65 per cent. According to him, the high proportion of food and plant waste was due to the fact that Ghana's economy largely depended on agricultural products for export and domestic consumption.

### **2.7.2 Problems of Waste Management**

In Ghana, Boadi and Kuitunen (2004) pointed out some of the problems affecting solid waste management. These include: weak institutional capacity and lack of resources; both human and capital. They also indicated that, home collection of waste is limited to high and, some middle income areas while the poor are left to contend with the problem on their own. This leads to indiscriminate disposal of waste in surface drains, canals and streams, creating unsanitary and unsightly environments in many parts of the city. Furthermore, MLGRID (2004) summarises the challenges of solid waste management in Ghana as follows: poor planning for waste management programmes; inadequate equipment and operational funds to support waste management activities; inadequate sites

and facilities for waste management operations; inadequate skills and capacity of waste management staff; and negative attitudes of the general public towards the environment in general.

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

### **2.7.3 Solid waste management in the hospitality industry**

From a sustainability perspective, the improvement of waste management practices of the hospitality industry is a pivotal part of its overall green strategy. This issue must be addressed not only by the staff of the establishments at the different stages of operation, but also the administration must draw out strategies which would encourage guests to generate less waste. Though the latter is addressed more easily in some places than others, due to the nature of the guests frequenting the property and their ecofriendly tendencies, this is something which eventually needs to be addressed by hotels and restaurants all over the world.

This is especially true when considering food waste, due to the fact that it is a type of waste that is very difficult to reuse, and so once generated by the guest, there is little the staff can do to reuse it. Yes, it may be used to produce compost or renewable energy, but this is generally not considered as favorable an alternative as being used to feed people, as emphasized by the 'food use hierarchy' (European Union Committee, 2014). There are many factors which affect how a certain property processes its waste and to what extent it implements recycling. These factors include the location of the property, the type of



materials being recycled, and the availability of sorting/recycling facilities in its locality.

Once implemented, the success of a recycling program depends on factors such as the “availability of buy-back centers, waste management contractors' willingness to participate in recycling programs, and effective employee education programs” (Shanklin & Hackes, 2001). The adoption of environmental practices by a hotel also depends on factors such as the hotel size, age, the chain it belongs to, and stakeholder pressure (Alvarez Gil et al., 2001). In addition, a study of 52 hotels in Ghana found that larger properties with higher stars ratings were found to implement environmentally-friendly strategies to a greater extent than smaller properties (Mensah, 2006). Another study investigated the policies at eight properties in Mexico, four of which were owned by Mexicans and four by Americans.

The managers of these hotels answered surveys through which it was found that the American-owned hotels had implemented more environmental strategies, such as those related to waste management, earlier than the Mexican-owned hotels. The hotels owned by Mexicans seemed to have put such environmental policies into practice mainly in response to legal pressure (Revilla et al., 2001). Moreover, though sustainable practices are becoming more and more popular, changes in policy and regulation, followed by proper enforcement and monitoring, are still seen as the most effective ways to bring about measurable change throughout an entire country (Ball and Abou Taleb, 2010).

## **2.8 Waste minimization in the hospitality industry**

When one thinks of waste management, terms such as recycling and waste-to-energy are often remembered. However, it is the waste management hierarchy which helps hotel and restaurant administrations make decisions in terms of which waste management strategies should be employed under different situations. It is not wise to

consider only one option such as recycling to solve a property's waste management problems. Rigidly set recycling targets may not lead to the environmental advantages expected. For example, to recycle a particular material, the hotel may have to send it very far, and this would actually lead to a carbon footprint much greater than the savings from the actual recycling. It is therefore recommended that when using tools to decide on waste management options, each situation should be assessed individually by the hospitality property administration from the environmental, social and financial perspectives (Chertow, 2000).

The waste management hierarchy is only one step of the waste management process pursued in the hospitality industry. As is evident, various factors such as prevalent legislative and economic constraints affect the decisions made by the hospitality property management when it comes to how they should deal with their waste. For effective waste management, the establishment must have a good relationship with its waste services provider, and what waste treatment operations the property decides to have on site, if any, depend on what facilities its waste service provider offers and at what cost. A waste audit must also be carried out by the establishment at regular intervals, in addition to the daily waste generation statistics it keeps a record of. It is the results of such audits which enable the hotel/restaurant to actually calculate the cost of different waste treatment options.

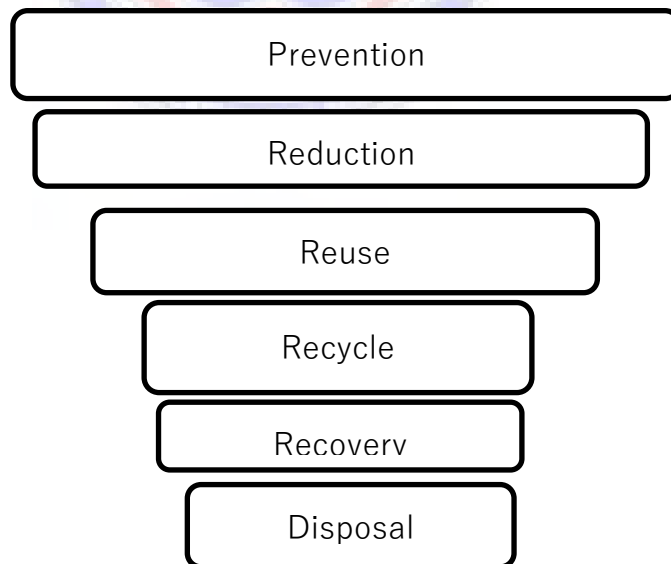
## **2.9 Conceptual Framework**

### **2.9.1 The Waste Management Hierarchy (WMH) Model**

The WMH provides a model of the potential options for managing waste, namely, prevention, reduction, reuse, recycling, recovery and disposal (Waste Online, 2016). The model indicates an order of preference of actions to reduce and manage waste, presented diagrammatically in the form of a pyramid (UNEP, 2013), as shown in Figure 1. The

higher up the hierarchy a waste management strategy is, the more sustainable it is (Nath, 2014). Thus, based on the environmental impacts of the various waste management options, waste prevention is the most preferred option while disposal at landfill is the least preferred option. Waste prevention means eliminating or reducing the amount or the toxicity of waste, including recyclables (Zorpas & Lasaridi, 2013).

Waste reduction, on the other hand, means reducing the amount of waste produced through greater efficiency in the use of resources. Reuse is a process of putting waste materials back into use instead of discarding them so that they do not go into the waste stream, while recycling involves transforming or reprocessing the waste materials into new products. Though not all wastes can be reduced, reused or recycled, energy could be recovered from such wastes instead of being dumped. Sustainable waste management practices require optimization of the recovery of materials and energy from different waste streams in order to minimize the environmental impact, while maximizing the utilization of potential material and energy sources (Mirabella, Castellani, & Sala, 2014).



Source: Waste Online (2016)

*Figure 1: Waste Management Hierarchy*

At the bottom of the hierarchy is disposal, which is the least preferred waste management option. It involves the collection and disposal of waste at landfill sites. Solid waste generated from hotels is disposed of primarily in landfills. However, landfilling results in leaching, which pollutes the underground water table, enervates the quality of the soil, and permanently renders land unusable for any other purpose (Singh, Cranage, & Nath, 2014).



## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Study Area

Berekum Municipal is located in the Brong - Ahafo Region of Ghana. The Berekum municipality was selected based on its rapid expansion and urbanization according to the 2010 Population and Housing Census (Ghana Statistical Service, 2012). The location and size and population characteristics were considered under this section. The total land size of the municipality is 1,635 km<sup>2</sup> with 578.63km<sup>2</sup> covered by forest reserves. This area forms about 0.7% of the entire Ghana land area of 233,588 km<sup>2</sup>.

The Berekum Municipality lies between latitudes 6° 27N and 1° 00N and longitude 2. 52W and shares common boundaries with Sunyani in the North West, Dormaa East on the North East, Jaman District in South-West and Iain District in South East (NI)PC, 2012). According to the 2010 Population Census of Ghana, the population of the municipality stood at 129628 (Ghana Statistical Service, 2012). This figure represents a percentage change of 39% over the 2000 figure of 93235. The annual average growth rate of 2.2, the population of the municipality is estimated to approximately 144,528 by 2015 and a doubling in 31 years. This growth rate compares favorably with both the regional and national rates of 2.3% and 2.5 % respectively. The female form about 53% and the remaining 46% constitutes male population. The total land area of the municipality is 1635 km<sup>2</sup>. This gives a population density of 79.2 persons per km<sup>2</sup> as compared to that of the region which stands at 46 persons per km<sup>2</sup>. It is important to note that the municipality is very densely populated due to the fact that a large area is taken up by 29 forest and farmlands. As a result, the population of the municipality is concentrated in the capital Berekum; there are four main religions groups in the Municipality. They are Christians which is the most predominant sector with 95% followed by Muslims 2.7 %, traditional 1.4 % and others being 0.9%.

### **3.2 Research Design**

The research design involves how the research materials are to be collected (Giddens, 2005). The researcher used case study. According to Kumekpor (2002) it is a method of careful and critical inquiry or investigation and examination seeking the facts of a case, problem, an issue, a community, etc. Quantitative research approach was used. Quantitative research is deductive; therefore, the researcher would try to explain one phenomenon with the sample of variables (Bryman and Bell, 2017).

Also quantitative method gives the opportunity to cover bigger, comparatively to the qualitative method, sample of respondents which creates more possibilities to make any kind of generalizations. This design enabled the researcher to grasp and understand the special and peculiar issues that pertain to waste management in the hospitality industry in Berekum Municipality.

### **3.3 Population of the Study**

A research population is defined as a group to which the researcher wants to study and generalize (Kumekpor, 2002). A population is always of the individual who possess certain needed characteristics a particular study intends to analyze. A population is also defined as including all people or items with the characteristic one wish to understand. The population was made up of 25 staff at the hotel. For the purpose of this study, the population is made up of all the staff of Ahenfie Hotel.

### **3.4 Sampling Techniques and Sample size**

The sampling technique that was used for this study was simple random sampling and purposive sampling. The use of this simple random sampling technique ensured fairness and reduced bias in the selection and elimination of stakeholders that constituted

the final sample size for this study. The simple random sampling technique was used to sample the 20 staff members and customers of the Ahenfie Hotel. The purposive sampling technique was used to select the managers of the Ahenfie Hotel and stakeholders in the hospitality industry in the municipality.

### **3.5 Data Collection Instrument**

The researcher used questionnaire which he personally administered as data collection method. The questionnaire was designed in a concise and precise language to avoid ambiguity, and also to arouse the respondent's interest. The questionnaire consisted of well structured (close ended) multiple choice questions, which just required ticking the right answers by the respondent. It also consisted of unstructured (open ended) questions, which allowed respondents to answer to the questions in their own words and freedom. The researcher decided to use questionnaire to allow responses to be gathered in a standard way, bringing out objectivity and reducing bias.

Also, the use of questionnaire, allows information to be presented in numerical and graphical backgrounds. The use of questionnaire is not without its limitations. Since questionnaires are issued after the event being researched has taken place, there is the likelihood that many respondents would have forgotten major parts in the events being researched. Another limitation is that of distribution of the questionnaire, as it might not include all employees as some employees may have been absent from work, while it was being distributed for various reasons.

The respondents chosen for the interview were management members. As a supplement to the questionnaire, the interview method was adopted to ascertain some of the information that could not be accessed using the questionnaire. The researcher personally conducted all interviews which were at the convenience of the respondents.

### **3.6 Data analysis**

According to Saunders et al. (2009), analysis is the ability to break down data and to clarify the nature of the component parts and the relationship between them. The researcher analyzed and interpreted his data by linking them to the theory, problem, purpose and research questions and he made sure that there is coherence throughout the entire thesis. Data was analyzed with the Statistical Package for the Social Sciences (SPSS) to obtain frequencies and percentages of closed end responses. This was to identify trends that appeared from response (Maxwell, 1996). Open-ended qualitative responses were analyzed through data reduction, display, conclusion creation, and triangulation to identify trends.





## CHAPTER FOUR

### PRESENTATION OF DATA, ANALYSIS AND DISCUSSIONS

#### 4.1 Demographic Characteristics of Respondents

On the gender of the respondents, it was realized from the study that majority of employees in Ahenfie Hotel were males as 70.0% of the respondents who were contacted were males whereas 30.0% of the respondents were females. These confirms the results in the 2010 population census that claims workforce in the country is dominated by males. Again it was also realized that 90% of the respondents were above 25 years and should have some sought experience in waste management practices therefore all other things being equal they should be abreast with of the waste management practices of Ahenfie Hotel. Again, the employees were youthful as 90% of the respondents were below 55 years.

On education, only 20.0% of the respondents had formal education and could not read and write, 40.0% of the respondents had completed the basic school level, followed by 30.0% of respondents who have had either secondary, vocational or technical school education and 10.0% of the respondents completing the tertiary level of education. These shows that majority of the respondents can read and write.

**Table 4.1: Demographic Characteristics of Respondents**

<b>Item</b>	<b>Classification</b>	<b>Frequency</b>	<b>Percentage</b>
Gender	Male	14	70
	Female	6	30
	<b>Total</b>	<b>20</b>	<b>100</b>
Age group	Below 25 years	2	10
	26-35 years	10	50
	36-55 years	6	30
	Above 55 years	2	10
	<b>Total</b>	<b>20</b>	<b>100</b>
Educational level	Tertiary	2	10
	Secondary/Vocational/Technical	6	30
	Basic	8	40
	No formal education	4	20
	<b>Total</b>	<b>20</b>	<b>100</b>
Marital status	Single	8	40
	Married	4	20
	Divorced	4	20
	Separated	2	10
	Widow	2	10
	<b>Total</b>	<b>20</b>	<b>100</b>

**Source: Field Data 2020**

On the record of usage of the facility, from the client attendant or receptionist on a normal day 12 persons use the facility but it can rise up to 40 persons in day at peak times as they have 26 rooms. The restaurant is the most utilized, at least 100 persons visit the premises and eat and on occasions and special programmes they are overwhelmed by attendance.

From the table below it shows that there are 3 administrative staff in Ahenfie Hotel including the Manager, Accountant and the Supervisor who manage both the hotel and restaurant, 7 employees in the restaurant which includes the cooks and the waiters. Again, there are 4 housekeeping staff and 2 cleaners whose work schedules are not really defined. There are two receptionists and 2 others whose main duties are to keep security but helps in car parking and others.

**Table 4.2: Department of Employees**

Department	Frequency	Percen
Administration	3	15.0
Reception	2	10.0
Restaurant	7	35.0
Housekeeping	4	20.0
- Cleaners	2	10.0
Others Specify	2	10.0
Total	20	100.0

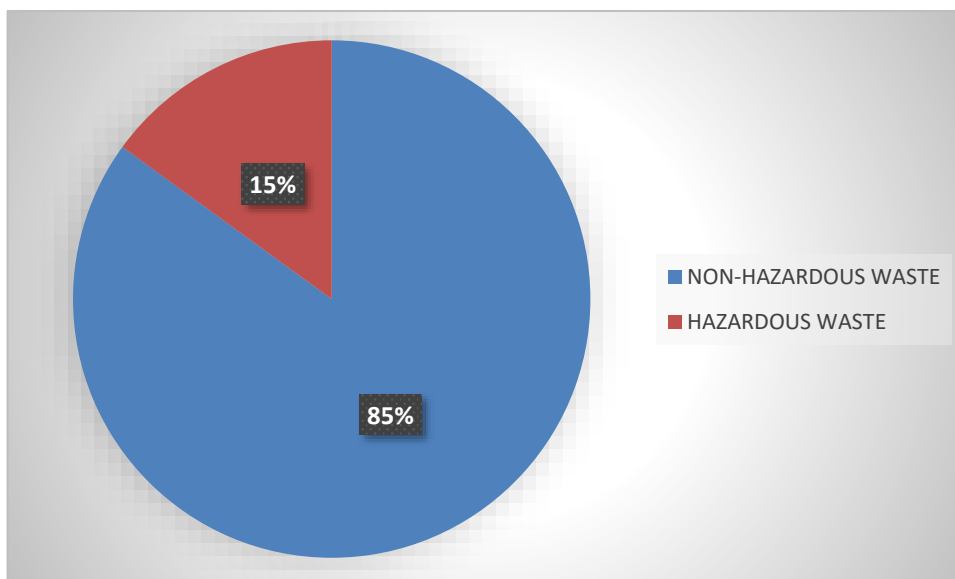
**Source: Field Data 2020**

#### **4.2 Waste Category/Nature of Waste Generation**

Waste generation is considered by some to be the most noticeable effect which the hospitality sector has on the environment, especially due to the fact that many of the establishments which make up this sector, such as hotels, use large quantities of consumer goods as part of their operations. From the study it was realized that the major waste product of the hotel is food products such as prepared meals, package products such as bottled water and drinks. Others include aluminum, plastics, glass, steel, cardboard and papers.

Again it was realized form the study that there are two types of waste produced in the hotel that is hazardous and non-hazardous waste as much as 17 (85%) of the

respondents said the hotel produces non hazardous waste. Specifically, example of non hazardous waste generated in the hotel were food and kitchen waste leftovers, used or dirty papers and wrapping, plastic wrapping or bags, composite wrappers, cardboard packaging, printed documents, brochures, menus, maps, magazines, newspapers, bags, bottles (that did not contain hazardous chemicals), food containers, mayonnaise, mustard and tomatoes puree tubes, aluminium packaging, bottles, jars, flasks, table cloths, bed-linen, napkins, clothes, rags, wooden packaging, pallets, fruit and vegetable peelings, flowers and plants, branches, leaves and grass and 3(15%) of them also said the hotel generates hazardous waste. In a hotel environment, common potential hazardous wastes generated specifically include, polishes (used on the floor, metal, shoes and furniture), cleaning and disinfecting products (carpet and oven cleaners, detergent, bleach, spot removers and pool chemicals), office products (white-out fluids, permanent ink markers, photocopying and printing fluids), pesticides, fungicides, and herbicides used around the hotel, solvents and aerosols, including air fresheners, oil based paints and varnishes, cooling tower and chilled water chemicals, and freon products, flammables (sterno gas, lubricating oil), motor oil, batteries, fluorescent lamps, light bulbs, computers and monitors and asbestos.



**Figure 4.1: Category of Waste**

**Source: Field Data 2020**

**Table 4.3: The type and sources of waste are shown in the tables below**

<b>Waste</b>	<b>Source</b>
Household waste	Hotel's different departments
Cardboard	Administration, reception, guest rooms, restaurants
Paper	Administration, reception, guest rooms, restaurants
Plastics	Administration, guest rooms, restaurants, kitchens
Glass	guest rooms, restaurants, kitchens
Cloth	Administration, reception, guest rooms, restaurants
<b>Organic waste</b>	Gardens, guest rooms, restaurants, kitchens

**Source: Field Data 2020**

**Table 4.4: Hazardous Waste**

<b>Waste</b>	<b>Source</b>
Frying Oil	Kitchen, restaurant
Paint and solvent residue	Maintenance
Flammable materials	Kitchen, gardens
Fertilizers and chemical	Gardens
Ink cartridges IT Disks and CD's	Administration

**Source: Field Data 2020**

#### 4.4 Waste Management Plan

**Table 4.5 Location of Waste containers**

	Frequency	Percent
Yes	3	15.0
No	11	55.0
I don't know	6	30.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

**Source: Field Data 2020**

From the table above it is shown that a majority 11 of the respondents said dust bins cannot be found at every department while only three of the respondents said dust bins can be found at every department in the hotel and as much as 6 of the respondents claimed they do not know whether there are dustbin in all departments of the hotels.

On waste being kept in the same container, as much as 15 of the respondents claimed that all kinds of waste are kept in the same dustbins while 2 and 3 of the respondents said different kinds of rubbish are kept in different waste containers and do not know whether or not if they are segregated respectively.

**Table 4.6: Waste Management Practices**

No.	ITEMS	M X	SD
1	Regulating activities such as cleaning, weeding, washing and smoking that can lead to hazardous conditions.	4.87	0.67
2	Properly controlling waste	4.83	0.69
3	Weed and grass control	4.76	0.75
4	Monitor staff to maintain operational tidiness and order	4.54	0.78
5	Materials handling and storage	4.52	0.83
6	Monitor staff to clean and treatment of floors	4.34	0.87
7	Monitor staff to sweep compounds	4.32	0.89
8	Monitor staff to polish furniture	3.98	0.94
9	Rubbish handling is essential to the waste management process.	3.81	0.96

**Source: Field Data 2020, n=20**

According to the report, the hotel's waste management activity is to control practices such as sweeping, weeding, washing, and smoking, all of which may result in unsafe conditions (mean score of 4.87, SD - 0.67). The study concluded that the hotel staff's job as housekeepers is to control potentially dangerous activities such as sweeping, weeding, washing, and smoking. Cutting grass and removing it is a good practice, as is burning it in piles if environmental laws allow it. Extinguishing equipment should be sufficient and readily accessible.

The hotel's waste management practice, according to the report, is to properly monitor waste (mean score of 4.83, SD - 0.69). The study concluded that one of the hotel staff's responsibilities as housekeepers is to properly manage waste. According to Jones and Pizam (2018), housekeeping consists of the more basic aspects of building care and

20

maintenance, such as maintaining organizational tidiness and order, properly managing waste, and regulating dangerous activities such as sweeping, weeding, washing, and smoking. Housekeeping requires coordination and constant supervision to be effective.

The hotel's waste management operation, according to the report, is to weed and monitor grass and bush (mean score of 4.76, SD - 0.75). The hotel's housekeepers' job is to weed and keep grass and bush under control. The amount of various chemicals required for effective weed control, as well as the length of their effect, differ depending on the weed-killing agent used, the vegetation's character, and atmospheric and soil conditions. The quantities that employees can use under different circumstances are specified in the manufacturer's instructions. When grass fires grow out of control, burning as a means of clearing dry grass and weeds often ignites houses. This threat is effectively avoided by controlled burning at the appropriate time of year under strict fire department supervision.

The hotel's waste management practice, according to the report, is to maintain organizational tidiness and order (mean score of 4.54, SD - 0.78). According to the findings, the hotel staff's job as housekeepers is to maintain operational tidiness and order. Dry weeds and grass around houses, highways, and railways pose a significant fire danger. The people who manage these areas have only had one goal in mind: to eradicate vegetation. Adding a chemical solution that acts as a pesticide on the weeds is a popular weed removal process. However, certain chemicals can be hazardous. Chlorate compounds, especially sodium chlorate, are examples of oxidizing agents. When they come into contact with fuel while not burning, they improve the conditions for fire or explosion. Several fires in the summer culminated in the application of sodium chlorate solution to dry grass and weeds.

According to the research, the hotel's waste management strategy is to properly treat and store products (mean score of 4.52, SD - 0.83). The staff's job as housekeepers in the hotel



is to properly manage materials and store them. Outside of houses and homes, good housekeeping is just as critical as inside. The fire protection of exposed buildings and stored products outside may be jeopardized if household maintenance is neglected. The accumulation of garbage and waste, as well as overgrown grass and weeds adjacent to buildings or stored goods, are likely the most common threats. It is important to investigate the causes and address the issues.

The hotel's waste management operation, according to the report, is to clean and disinfect floors with disinfectants and detergents (mean score of 4.34, SD - 0.87). The hotel's housekeeping team cleans and disinfects the surfaces with disinfectants and detergents. These disinfectants destroy all germs and bacteria while also making cleaning easier. Good housekeeping practices and supervision, according to Tesone and Pizam (2018), are critical to basic workplace safety. Workplace health and safety laws require senior management to take a risk management approach to reduce workplace health and safety risks. This entails taking a proactive approach to determining all of the risks associated with bad housekeeping and putting in place control mechanisms to minimize or, if that isn't feasible, reduce the risks to the lowest level possible.

The hotel's waste management operation, according to the report, is to sweep compounds (mean score of 4.32, SD - 0.89). The hotel staff's job as housekeepers is to sweep the grounds and burn any unnecessary trash. This method has proven to be effective in preserving cleanliness and thus reducing the risk of fire. If the locker area has automatic sprinklers, the tops of the lockers should be enlarged metal or screen so that water from the sprinklers does not enter the locker contents. Workers should cover the top with paper to shield their belongings from dust if appropriate. Using the tops of lockers for storage is a terrible idea from the perspective of fire and injury prevention. Sloping tops solve this problem because workers cannot place items on the top.

The study demonstrates that the hotel's waste management activity is to polish furniture (mean score of 3.98, SD - 0.94). The staff's roles as house keepers in the hotel is to polish furniture so that they may look neat.

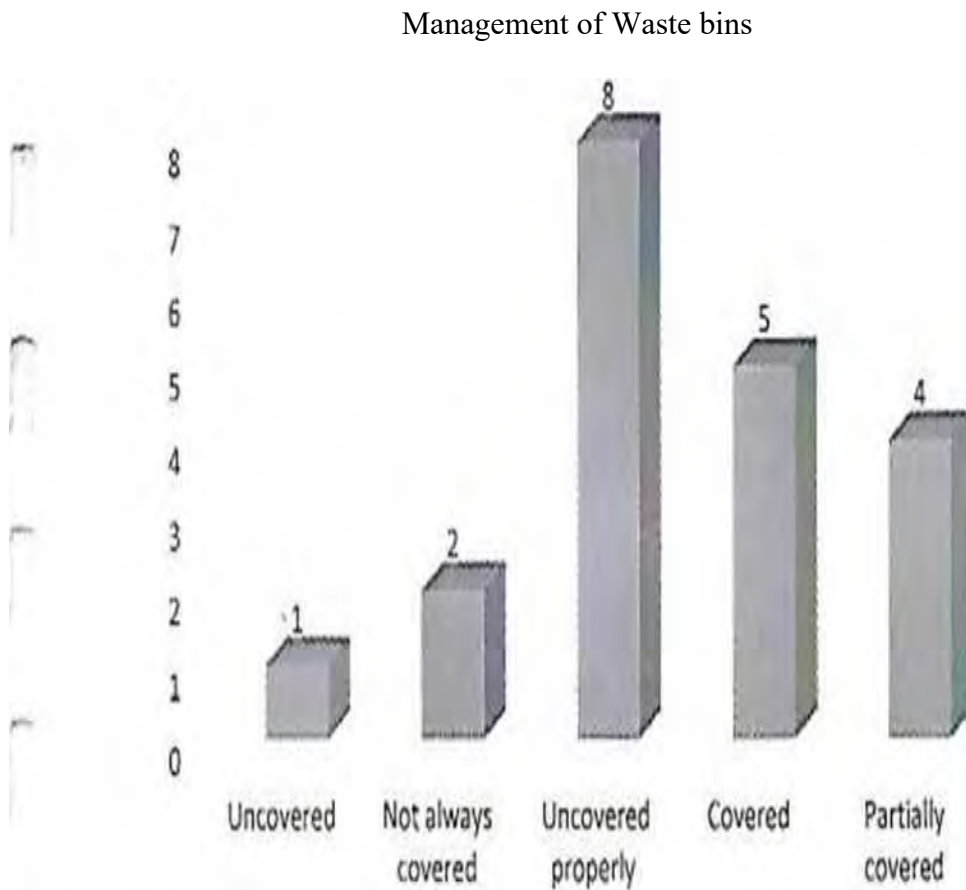
The findings of the study indicate that waste handling is critical to the waste management process (means core of 3.81, SD - 0.96). According to the report, waste management is critical to the housekeeping operation. The most satisfactory approach to the inevitable accumulation of waste for most organisations is daily garbage disposal. Burning garbage is generally dangerous, and most cities prohibit it (Tesone, & Pizam, 2018). And in landfills, dumping trash poses a fire hazard. Fire may be carried a long way by sparks from a dump fire or a bonfire. This can also happen if the company burns trash in an incinerator that isn't equipped with a sufficient spark arrestor. In most parts of Michigan, there are certain days when dry conditions make burning is dangerous. Usually night and early morning are the safest time to burn rubbish because of there is more moisture. This helps to reduce the chance of ignition from sparks.

**Table 4.7: Waste Kept in Same Container**

	<b>Frequency</b>	<b>Percent</b>
Yes	15	75.0
No	2	50.0
I don't know	3	15.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

**Source: Field Data 2020, n=20**

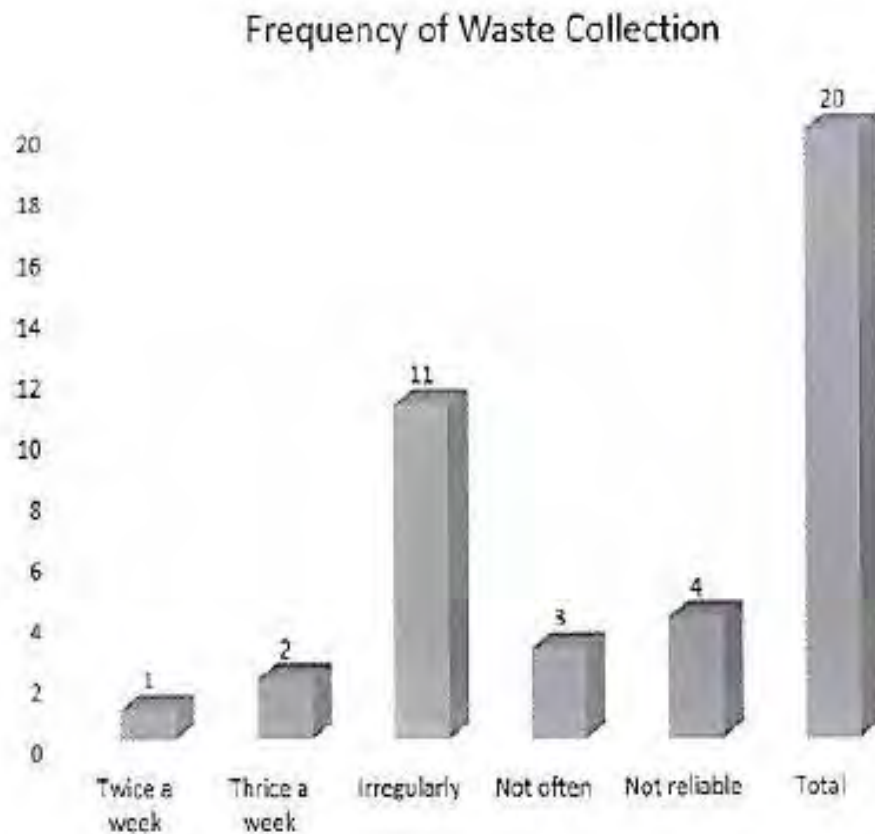
On the type of waste containers used all the respondents unanimously claimed the hotel uses plastic bins to collect waste generated. Again all the respondents claimed the waste bins in the hotel are not labelled.



**Figure 4.2: Management of Waste Bins**

**Source: Field Data 2020**

20



**Figure 4.3: Frequency of collecting waste Source: Field Data 2020**

On where the waste are kept before the collection, the respondents claimed that there is a space at the back of the hotel where all the waste gathered are kept in plastic rubbers and then it is finally collected by the waste management company contracted by hotel management to the municipal dumpsite. The respondents also said the waste are burnt at the municipal dumpsite without any incineration.

#### 4.5 Regulatory and Safety Issues

The study revealed that the cleaners are responsible for waste management in the hotel and that there is no team put in place to manage waste. In the hotel the cleaner on duty is supposed to gather all the waste in the plastic bins in into plastic rubbers and dump them at the back of the hotel for collection by the waste management company.

On waste management policy issues, the respondents unanimously agreed that they have not ever seen any document on the hotel's waste management policies and they have also not seen any manual or guide on how to manage waste in the hotel.

**Table 4.8: Documentations of waste collected**

	<b>Frequency</b>	<b>Percent</b>
Yes	5	25.0
No	13	65.0
I don't know	2	10.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

**Source: Field Data 2020**

From the study it was found that a majority of 13 of the respondents constituting 65% said they do not document the size of waste collected whereas 5 of the respondents were in disagreements and they claimed the quantity of waste collected is documented but 2 respondents said they are not aware of any documentation of the quantity of waste collected.

Again as shown in the table below majority of the respondents that 18 of them claims they have never attended any waste managing training before while only 2 of the respondents said they have attended a waste managing training before but surprisingly the persons who claimed they have attended waste management training had little or nothing to do with collection of waste in the hotel

**Table 4.9: Waste Management training**

	Frequency	Percent
Yes	2	10.0
No	18	90.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

**Source: Field Data 2020**

**Table 4.10: Wearing Protective Equipment**

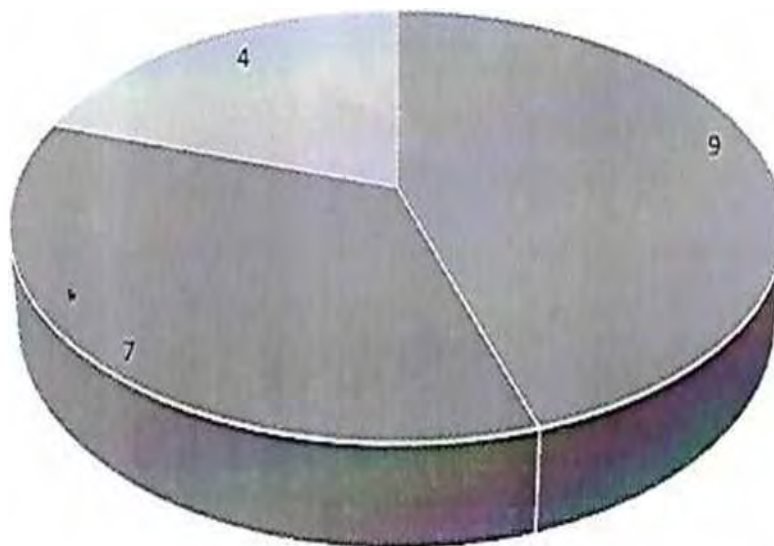
	Frequency	Percent
Yes	8	40.0
No	7	35.0
I don't Know	5	25.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

**Source: Field Data 2020**

A slight majority of 8 of the respondents said that persons managing or handling waste in the hotel were personal protective equipment's, whereas 7 of the respondents disagreed that the employees managing or handling waste wear personal protective equipment's, 5 of the respondents claimed they do not know whether or not if employees managing and handling waste wear personal protective equipments.

From the responses the researcher decided to investigate whether or not they are aware of what personal protective equipments are and it was realized that they are aware of what personal protective equipments and they included gloves, apron, nose mask, goggles, safety boots etc.

Experience of Injury



• Yes • No • Not Aware

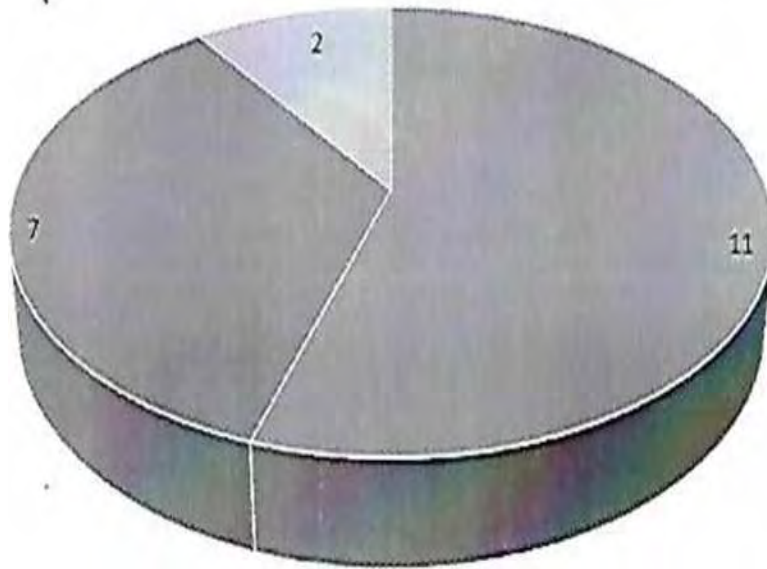
**Figure 4.4: Injury Experienced Source:**

**Field Data 2020**

On the experiencing of injuries in handling or managing waste as much as 9 of the respondents claimed there have reported cases of injury in the hotel but 7 of the respondents claimed there have been no report of injury in managing or handling waste and 4 of the respondents said they unaware of any injury cases related to handling of waste in the hotel.

As shown in the figure below, a slight majority of the respondents that 11 representing majority of them said they are happy with waste management practices in the hotel. 7 of the respondents said they are not happy with the way waste is been managed in the hotel but 2 of the respondents said they are neutral claiming they cannot state whether or not if they are happy with the waste management practices of the hotel.

### Happy with waste management practices



■ Yes » No Neutral

**Figure 4.5: Happy with waste management**

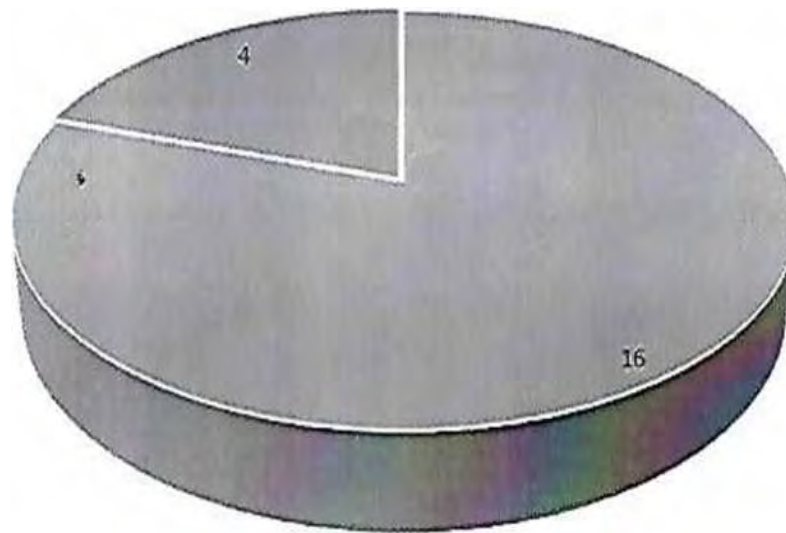
**Practices Source: Field Data 2020**

#### **4.6 Challenges of Waste Management Practices**

From the figure below it is shown that from the respondents that refuse do overflow at where they keep the refuse for pickup whiles of the respondents claimed the refuse do not overflow at where they are kept.



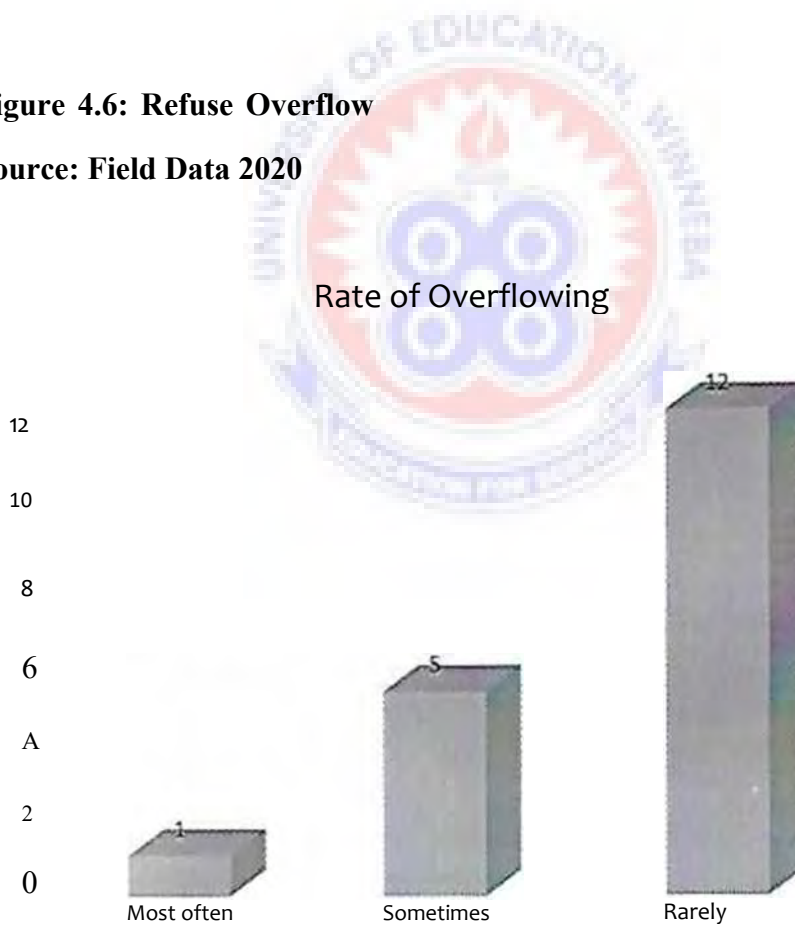
Refuse Overflow



**Figure 4.6: Refuse Overflow**

Source: Field Data 2020

Rate of Overflowing



**Figure 4.7: Rate of Overflow**

Source: Field Data 2020

On the frequency of overflowing majority of the respondents claimed the refuse rarely overflows while 5 and 1 of the respondents said it do overflow sometimes and most often respectively.

All the respondents unanimously agreed that the refuse dump is not too high

**Table 4.11: Challenges of Waste Management**

<b>Department</b>	<b>Frequency</b>	<b>Percent</b>
Distance is far	5	25.0
Financial constraints	2	10.0
Lack of better containers	9	45.0
Others	4	20.0
<b>Total</b>	<b>20</b>	<b>100.0</b>

**Source: Field Data 2020**

On the challenges the persons managing waste in the hotel include is distance far for where they gather the waste as claimed by 5 of the respondents. A majority of 9 of the respondents said lack of better waste containers is a major challenge in managing waste in the hotel. 2 and 4 of the respondents said financial constraints and others such as waste not been segregated are challenges.

## CHAPTER FIVE

### SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

#### 5.1 Summary

The main objective of the study sought to assess the waste management practices in hospitality industry services in the Berekum Municipality. The researcher used case study. Quantitative research approach was used. A population is also defined as including all people or items with the characteristic one wish to understand. For the purpose of this study, the population is made up of all the staff of Ahenfie Hotel. The population was made up of 25 staff at the hotel. The simple random sampling technique was used to sample the 20 staff members and customers of the Ahenfie Hotel. Questionnaires were the main instrument used to gather primary data. Data was analyzed with the Statistical Package for the Social Sciences (SPSS) to obtain frequencies and percentages of closed end responses. Descriptive statistics was used to analyse data.

#### 5.2 Summary of Findings

This section presents the following key findings of the study arising from analysis and discussion of the study.

##### **The waste management practices of the Ahenfie hotel in Berekum Municipality.**

The study shows that staff's roles as waste managers in the hotel is to regulate activities such as cleaning, weeding, washing and smoking that can lead to hazardous conditions (mean score of 4.87, SD - 0.67). The study revealed that, staff's roles as waste managers in the hotel is to properly control waste (mean score of 4.83, SD - 0.69).

The study depicts that staff's roles as waste managers in the hotel is to weed and control grass and bush (mean score of 4.76, SD - 0.75). The study depicts that staff's roles as waste managers in the hotel is to maintaining operational tidiness and order (mean score of 4.54, SD - 0.78).

The study shows that staff's roles as waste managers in the hotel is to handle materials well and store them properly (mean score of 4.52, SD - 0.83). The study indicates that staff's roles as waste managers in the hotel is to clean and treat floors with disinfectants and detergents (mean score of 4.34, SD - 0.87).

The study reveals that staff's roles as waste managers in the hotel is to sweep compounds (mean score of 4.32, SD - 0.89). The study demonstrates that student's roles as waste managers in the hotel is to polish furniture (mean score of 3.98, SD - 0.94).

The study results show that rubbish handling is essential to the housekeeping process (means core of 3.81, SD - 0.96). The study indicated that rubbish handling is essential to the housekeeping process. For most organizations, the regular collection of rubbish is the most satisfactory solution to the unavoidable accumulation of waste.

#### **The Methods used by Ahenfie Hotel to deal with the waste they generate.**

Furthermore, the study revealed that the waste bins were not properly covered and waste were gathered and kept in rubber bags and placed on a parcel of land behind the hotel for pickup. The waste were not collected in regular intervals and therefore was giving the waste handlers challenges. The study realized form the study that there are two types of waste produced in the hotel that is hazardous and non-hazardous waste. Example of non hazardous waste generated in the hotel were food and kitchen waste leftovers, used or dirty papers and wrapping, plastic wrapping or bags, composite wrappers, cardboard packaging, printed documents, brochures, menus, maps, magazines, newspapers, bags, bottles (that

did not contain hazardous chemicals), food containers, mayonnaise, mustard and tomatoes puree tubes, aluminium packaging, bottles, jars, flasks, table cloths, bed-linen, napkins, clothes, rags, wooden packaging, pallets, fruit and vegetable peelings, flowers and plants, branches, leaves and grass.

Moreover, in a hotel environment, common potential hazardous wastes generated specifically include, polishes (used on the floor, metal, shoes and furniture), cleaning and disinfecting products (carpet and oven cleaners, detergent, bleach, spot removers and pool chemicals), office products (white-out fluids, permanent ink markers, photocopying and printing fluids), pesticides, fungicides, and herbicides used around the hotel, solvents and aerosols, including air fresheners, oil based paints and varnishes, cooling tower and chilled water chemicals, and freon products, flammables (sterno gas, lubricating oil), motor oil, batteries, fluorescent lamps, light bulbs, computers and monitors and asbestos.

In addition, a worrying finding was that waste bins cannot be found at all departments in the hotel as claimed by the respondents and that waste is not segregated they are kept in same contained even though there several different categories of waste were identified. Again it was realized that the hotel uses plastic bins but were not labelled.

### **The Problems faced by the Hotel in Managing waste in the Berekum Municipality**

The study revealed that the cleaners are responsible for managing waste and that there is no waste management team in the hotel. There are no documents detailing waste management policies and manuals/guides to managed waste in the hotel. The hotel does not document the quantity of waste generated and the employees are not trained on how to manage waste. Again, the persons responsible for managing do not have adequate personal protective equipments and there have been cases of injuries reported in the hotel.

Finally, the challenges faced by the employees in the hotel included refuse overflowing in

the bins and at the dumpsite due to irregular pick up by the responsible company again far distance and financial constraints and lack of better containers. Other challenges included waste not been segregated.

### **5.3 Conclusions**

The study concluded that, hazardous and nonhazardous wastes were the categories of waste generated in the hotel. Moreover, staff's roles as waste managers in the hotel was to regulate activities such as cleaning, weeding, washing and smoking that can lead to hazardous conditions, properly control waste, weed and control grass and bush, maintain operational tidiness and order, handle materials well and give them proper storage, clean and treat floors with disinfectants and detergents, sweep compounds and burn all unwanted rubbish, polish furniture so that they may look neat.

The study shown that no records (documents) are kept on the quantity of waste generated and no segregation of waste is done. Waste containers are not properly covered and non- labeled according to WASH recommendations. There are no waste management training programmes for the employees in the hotel.

Through the survey, it came to light-that no waste management team (officer) exists resulting in ineffective supervision. Non-existence of waste management policy (legislation/regulation), lack of manual(guide) document as well as irregular interval of final collection and disposal of waste were revealed as some factors militating against improper management of the hotel's wastes. Generally, wastes generated by the hotel were not managed effectively and efficiently which could have a lot of health implications on both humans and other living organisms as a whole.

#### **5.4 Recommendations**

Based on findings and discussions in the previous chapter, the study makes the following recommendations:

1. The Management of the hotel should organize periodic workshops, seminars and conferences to enhance the knowledge and practical expertise of waste management supervisors to improve hygiene and cleanliness initiatives in the hotel.
2. Moreover, the waste managers in the hotel should continue to conduct training for all staff in the importance of good waste management practices, their role and the need for them to report hazards to their supervisor.
3. Hazardous waste should be treated and disposed of separately from non-hazardous waste.
4. There should be proper documentation on the quantity of waste generated to serve as a guide for effective and efficient planning.
5. Waste should be segregated using management tools like colour-coding and proper labeling of waste containers.
6. A team should be set up to manage waste in the hotel and an officer should be in place to ensure effective supervision of the waste handlers.
7. Waste management policy and manual/guide should be in place to regulate how waste would be managed since most of the employees can read and write.

#### **5.5 Suggestions for Further Study**

Therefore, the researcher suggested that a similar study should be conducted to examine housekeeping management practices of selected hotels in the Berekum Municipal. Housekeepers have a wide array of tasks they have to take care of in a day's work. The housekeeper is one of the most important employees in a hotel, some departments think that the housekeeping department is not worthy of even mentioning but without the housekeepers the hotel would not have anything to sell.

## REFERENCES

- Al-Aomar, R., & Hussain, M. (2018). An assessment of adopting lean techniques in the construct of hotel supply chain. *Tourism Management*, 69, 553-565.
- Anomanyo, S. (2004). Management of hotel waste: A case study of small hotels of Haryana state. *Journal of Economics and Management*, 1(9), 43-55.
- Alvarez Gil, H., Ball, S.; Taleb, M.A., (2001). *Benchmarking waste disposal in the Egyptian hotel industry. Tour. Hosp. Res.*, 11: 1–18 (**18 pages**).
- Ball, H., & Abou Taleb, S. (2010). *Environmental awareness and initiatives in the Swedish and Polish hotel industries–Survey results. International Journal of Hospitality Management*, 25, 662-682.
- Basu, A. J., & van Zyl, D. (2016). Industrial ecology framework for achieving cleaner production in the mining and minerals industry. *Journal of Cleaner Production*, 14, 299-304.
- Becklake, S. (2011). *Green issues thinking for the future waste disposal and recycling*. London, England: Aladdin Books.
- Boateng, D. & Nkrumah, G. (2006). Environmental management practices among hotels in the greater Accra region. *International Journal of Hospitality Management*, 25(3), 414-431.
- Ball, C. & Abou Taleb, H. (2010). Hospitality solid waste minimization: A global frame. *Int. J. Hosp. Manage.*, 11: 255–267 (**13 pages**).
- Boadi, D. & Kuitunen, F. (2004). Different shades of green: Environmental management in hotels in Accra. *International Journal of Tourism Research*, 16(5), 450-461.
- Chertow, B. (2000). Environmental accounting of municipal solid waste originating from rooms and restaurants in the Hong Kong hotel industry. *J. Hosp. Tour. Res.*, 25: 371–385 (**15 pages**).



- Centre for Environment and Development (2003). Importance of public relations management in small hotels. *Tourism and Hospitality Management*, 12(2), 231-243.
- Cespedes-Lorente, J., De Burgos-Jimenez, J., & Alvarez-Gil, M. J. (2013). Stakeholders' environmental influence: An empirical analysis in the Spanish hotel industry. *Scandinavian Journal of Management*, 19, 333-358.
- Chaabane, W., Nassour, A., & Nelles, M. (2018). Solid waste management key indicator development for hotels: A Tunisian case study analysis. *Recycling*, 3(4), 56-74.
- Chan, W. W., & Lam, J. C. (2011). Environmental accounting of municipal solid waste originating from rooms and restaurants in the Hong Kong hotel industry. *Journal of Hospitality and Tourism Research*, 25(4), 371-385.
- Chan, W. W., & Lam, J. C. (2012). A study on pollutant emission through gas consumption in the Hong Kong hotel industry. *Journal of Sustainable Tourism*, 10(1), 70-81.
- Denison, T. & Ruston, H. (1990). Managerial attitudes towards environmental management among small and medium hotels in Kuala Lumpur. *Journal of Sustainable Tourism*, 17(6), 709-725.
- Denison, N. & Ruston, G. (1990). Current options for the valorization of food manufacturing waste: A review. *Journal of Cleaner Production*, 65, 28-41.
- Davies, J. (2008). Encouraging sustainable business practices in a non-regulatory environment: A case study of small tourism firms in a UK national park. *Journal of Sustainable Tourism*, 11(5), 383-403.
- Dileep, M. R. (2017). Tourism and waste management: A review of implementation of "zero waste" at Kovalam. *Asia Pacific Journal of Tourism Research*, 12(4), 377-392.
- Erdogan, N., & Baris, E. (2017). Environmental protection programs and conservation practices of hotels in Ankara, Turkey. *Tourism Management*, 28, 604-614.
- Erdogan, N., & Tosun, C. (2009). Environmental performance of tourism accommodations in

- the protected areas: Case of the Goreme Historical National Park. *International Journal of Hospitality Management*, 28, 406- 414.
- Etzion, D. (2007). Research on organizations and the natural environment, 1992–present: A review. *Journal of Management*, 33, 637-64.
- European Union Committee, (2014). Estimation of GHG emission from hotel industry. *Anatolia*, 25(1), 39- 48.
- Fei-Baffoe, B. (2010). Small hotels in European tourism: The necessity of reconstruction of Croatian hotel industry. *Revue de Tourisme*, 4, 55–64.
- Fishbin, T. (2014). Benchmarking waste disposal in the Egyptian hotel industry. *Tourism and Hospitality Research*, 11(1), 1-18.
- Freduah, R. (2004). Private sector involvement in solid waste management in Ghana: The case of the Greater Accra Metropolitan Area (GAMA). *Waste Management and Research*, 28, 322-329.
- Giddens, V. (2005). *Sample size calculator*. Retrieved from: [www.raosoft.com/samplesize](http://www.raosoft.com/samplesize).
- Gilpin, M. (1996). Hong Kong hotels' sewage: Environmental cost and saving technique. *Journal of Hospitality & Tourism Research*, 33(3), 329-346.
- Ghana Statistical Service. (2012). *2010 population and housing census report*. Accra, Ghana: Ghana Statistical Service.
- Ghana Tourism Authority (2016). *Hotel directory*, Accra, Ghana: Ghana Tourism Authority.
- International Hotel Environmental Initiative, (2002). Examining the factors that impede sustainability in China's tourism accommodation industry: A case study of Sanya, Hainan, China. *Journal of Hospitality Marketing & Management*, 19(1), 38-55.
- Jessen, F. (2002). *Environmental implications of the tourism industry*. Retrieved from <https://www.csu.edu/cerc/documents/EnvironmentalImplicationsTourismIndustry2000.pdf>

- Jones, P., & Pizam, A. (2018). *A Handbook of Hospitality Operations & IT*. Oxford: Butterworth-Heinemann, Elsevier.
- Ketibuah, F., Byer, P. H., Hoang, C. P., Nguyen, T. T. T., Chopra, S., Maclaren, V., & Haight, M. (2010). Household, hotel and market waste audits for composting in Vietnam and Laos. *Waste Management & Research*, 24(5), 465-472.
- Kaza, S., Yao, L., Bhada-Tata, P., & Van Woerden, F. (2018). *What a waste 2.0: A global snapshot of solid waste management to 2050*. Washington, DC: World Bank Publications.
- Kreith, F. (1994). Environmental management in hotels. *International Journal of Contemporary Hospitality Management*, 7(6), 3-8.
- Kumah, K. (2007). *Environmental management in the hospitality industry: A guide for students and managers*. London, England: Cassell.
- Mensah, I. (2019). Environmental performance of tourism businesses: A case study of hotels in the GAR. In D. Leslie (Ed.), *Tourism enterprises and sustainable development: International perspectives on responses to the sustainability agenda* (pp. 139-156). London, England: Routledge.
- Mensah, B. & Larbi, K. (2005). Small hospitality businesses: Enduring or endangered? *Journal of Hospitality and Tourism Management*, 9(1), 1-12.
- Momoh, Y. & Oladebeye, G. (2010). Solid waste management practices in selected hotel chains and individual properties. *Hospitality Research Journal*, 15(1), 59-74.
- Nath, A. (2014). *Profitability and sustainability from waste management practices in hotels and its impact on environment* (Unpublished doctoral dissertation). Jaypee Institute of Information Technology, Noida, Uttar Pradesh, India.
- Ogawa, P.S. (2005). Stakeholder influence on the implementation of environmental management practices in the hotel industry. *International Journal of Tourism Research*, 18 (4), 387-398.

- Palmer, J. (2005). Environmental strategies in Spanish hotels: Contextual factors and performance. *The Service Industries Journal*, 24(3), 101-130.
- Pham Phu, S. T., Hoang, M. G., & Fujiwara, T. (2018). Analyzing solid waste management practices for the hotel industry. *Global Journal of Environmental Science and Management*, 4(1), 19-30.
- Riyaz, D., Alvarez-Gil, M. J., Burgos-Jimenez, J., & Cespedes-Lorente, J. J. (2010). An analysis of environmental management, organizational context and performance of Spanish hotels. *Omega*, 29, 457-471.
- Radwan, H. R., Jones, E., & Minoli, D. (2010). Managing solid waste in small hotels. *Journal of Sustainable Tourism*, 18(2), 175-190.
- Radwan, H. R., Jones, E., & Minoli, D. (2012). Solid waste management in small hotels: A comparison of green and non-green small hotels in Wales. *Journal of Sustainable Tourism*, 20(4), 533-550.
- Read, D. A. (2013). *What is integrated waste management (IWM)?* London, England: Waste and Environmental Management Research Unit, Kingston University.
- Revilla, G., Byer, P.H.; Hoang, C.P.; Nguyen, T.T.T.; Chopra, S.; Maclaren, V.; Haight, M., (2001). Household, hotel and market waste audits for composting in Vietnam and Laos. *Waste Manage. Res.*, 24: 465–472.
- Rojo, G., Glaus, M., Hausler, R., Laforest, V., & Bourgeois, J. (2013). Dynamic waste management (DWM): Towards an evolutionary decision-making approach. *Waste Management & Research*, 31(12), 1285-1292.
- Shafiul, D. & Mansoor, G. (2003). Estimating solid waste generation by hospitality industry during major festivals: A quantification model based on multiple regression. *Waste Management*, 77, 388-400.
- Shanklin, B. & Hackes, G. (2001). Concepts and Tools for Comprehensive Sustainability

- Assessments for Tourism Destinations: A Comparative Review. *J. Sustain. Tour.*,  
Tesone, D.V., & Pizam, A. (2018). *Handbook of Hospitality Human Resources  
Management*. Oxford: Butterworth-Heinemann, Elsevier.
- Todd, T. & Hawkins, J. (2003). Municipal solid waste generation rates and its management at  
Yusmarg forest ecosystem, a tourist resort in Kashmir. *Waste Management & Research*,  
32(2), 165-169. 44
- Tchobanoglous, G., Decatur, GA: Author Ghadban, S., Shames, M., & Mayaleh, H. A. (1993).  
Trash crisis and solid waste management in Lebanon: Analyzing hotels' commitment and  
guests' preferences. *Journal of Tourism Research & Hospitality*, 6(3), 1-18.
- The Centre for Environment and Development (2003). *Hotels care: Community action and  
responsibility for the environment*. London, England: Author
- Today Newspaper. (2020, April 27). *Accra generates 3,000 metric tons of waste in a day*.  
Retrieved from  
<https://www.todaygh.com/accra-generates-3000-metric-tonnes-waste-day/>
- Tsiboe, B. & Marbel, V. (2004). Do hotels' "green" attributes contribute to customer  
satisfaction? *Journal of Service Marketing*, 24, 157-169.
- UNEP, (2009). *Sustainable coastal tourism: an integrated planning and management  
approach*, UNEP manuals on sustainable tourism. United Nations Environment  
Programme, Nairobi.
- United Nations Environmental Programme. (2009). *Developing integrated solid waste  
management plan training manual* (Vol. 1). Osaka/Shiga, Japan: Author.
- United Nations Environmental Program. (2013). *Guidelines for national waste management  
strategies: Moving from challenges to opportunities*. Osaka/Shiga, Japan: Author.
- Waste Online. (2016). *After it's been binned*. Retrieved from  
<http://www.wasteonline.org.uk/resources/InformationSheets/WasteDisposal.htm#top>

- World Health Organization (WHO, 2008). *Waste reduction in hotels and motels. A guide for hotels and motels managers.*
- Zein, G., Wazner, B., & Meylan, J. (2008). Towards green guest houses in South Africa: The case of Gauteng and KwaZulu-Natal. *South African Geographical Journal*, 97 (2), 123-138.
- Zurbrugg, C. Y. (2009). An analysis and assessment of environmental operating practices in hotel and resort properties. *International Journal of Hospitality Management*, 26(3), 711-723.
- Zerbock, D. (2003). Cost effective disposal methods and assessment of waste generated in foodservice operations. *Foodservice Research International*, 13(1), 17-39.
- Zorpas, A., & Lasaridi, K. (2013). Measuring waste prevention. *Waste Management*, 33, 1047-1056.
- Zorpas, A. A., Voukkali, I., & Loizia, P. (2015). The impact of tourist sector in the waste management plans. *Desalination and Water Treatment*, 56(5), 1141-1149.

**APPENDIX I:**

**QUESTIONNAIRE FOR THE EMPLOYEES**

**QUESTIONNAIRE ON THE WASTE MANAGEMENT IN THE  
HOSPITALITY INDUSTRY**

The researcher is a Post graduate student of AAMUSTED, researching into waste management practices in hospitality industry services in the Berekum Municipality.

Guarantee is given hereby that any information provided shall be treated with the utmost confidentiality and will be used solely for the purpose for which it was obtained.

Please tick the appropriate answer or provide the necessary information.

**SECTION A: Demographic characteristics**

1. Age of respondent A. Below 18 years B. 18-35 years B. 36 60 years C.  
Above 60 years.
2. Gender A. Male B. Female
3. Educational Level of respondents A. No formal education B. Elementary/Primary  
School C. Junior Sec/Middle school D. Senior Sec./O-level/A-level E. Tertiary  
level.
4. Clients Attendance Record No of clients at day ..... (ii) No of Beds.....
5. Tick the Unit of the Hotel you are working at/on duty Administration [ ] Reception  
[ ] Restaurant [ ] Housekeeping [ ] Cleaners [ ] Others

Specify .....

**SECTION B: WASTE CATEGORY/NATURE OF WASTE GENERATION**

6. List the type of wastes that are generated at the unit you are working at/on duty

Administration

.....

Reception

.....

Restaurant

.....

Housekeeping

.....

Cleaner

.....

Others

Specify .....

7. What is/are the nature of the waste? Infectious [ ] Hazardous/Toxic ( )  
Non-hazardous/non- toxic [ ] General waste [ ] Highly infectious [ ]

**SECTION C: HOTEL WASTE MANAGEMENT PLAN/ISSUES (Waste**

**Segregation, Collection, Storage, Handling and Disposal/Treatment)**

8. Is/Are there waste container(s) at each unit of the hotel? YES [ ] NO [ ] NOT  
AWARE [ ]

9. Are the waste generated at each unit kept in the same container? YES [ ] NO [ ]  
NOT AWARE [ ]

10. What type of waste container (s) is/are used? Cardboard [ ] Paper boxes [ ]  
polythene bags [ ] Plastic bins [ ] Paper bags [ ] Metal bins ( ) none [ ]

11. Are the waste container(s) if any, labeled? YES [ ] NO [ ] NOT AWARE [ ]



12. How are these waste containers if any, labeled?

.....How are these waste containers (if any),  
managed? Uncovered  Not always covered  Uncovered properly  Covered   
 partially covered

13. How often are these hotel's wastes collected? Daily  Twice a week  Thrice a week   
 irregularly  Not often  Not reliable

14. Where are these waste kept/put/stored after collection from the various units of the hotel before final disposal? On the ground  In metal waste bins  In plastic bins   
 In polythene bags  On hotels premises  In paper boxes

15. How are these wastes disposed of from the hotel finally? To Municipal dump site   
 To landfill site  Dump behind hotel premises  To community dump site   
Dump in plastic waste bins  Dump in open shallow pit

16. How are these waste treated after final disposal? Burnt on the floor  Recycle   
Buried in open shallow pit  Deep burial  Incinerated  Open pit burning   
Reuse

**17. SECTION D**

**18. Personnel, Policy, Regulatory And Safety Issues On Waste Management**

19. (i) Who is/are responsible for the collection of waste from the various units of the hotel?

.....Is there/are you aware of any waste management team? YES  NO  NOT AWARE

20. Please, kindly list the membership of this waste management team as indicated below:

21. (i) Head of Waste Department/Officer:

.....

(ii) Team members:

.....

(iii) Waste handlers/workers:

.....A

Are you aware of any document containing waste management policy? YES  NO   
] NOT AWARE

22. Is/Arc there any manual/guide document on hotel waste? YES  NO  NOT  
AWARE

23. (ii) Do you document or record the quantity of  
wastes generated daily/weekly/monthly/yearly?  
YES  NO  NOT AWARE

24. Have you had/ever attended any waste management training course before? YES   
] NO  NOT AWARE

25. Is it necessary for hotel staff/workers to have hotel waste management training?  
YES  NO

26. Give reason(s)...

.....

27. Do the waste handlers/workers wear Personal Protective Equipment (PPE)? YES   
] NO  NOT AWARE

28. What is/are this/these PPEs? Gloves  Apron  Nose mask  Goggles  Safety  
boots

29. (ii) Have you ever experience any injury or any reported case of injury caused by  
Used equipment like sharps before? YES  NO

30. Are you happy with the way wastes are generally managed in your hotel?

YES [ ] NO [ ] NOT AWARE [ ]

**Section E: Challenges encountered in managing wastes**

31. Do the refuse dump overflow? A. Yes B. No

32. If yes how often? A. Most often B. Sometimes C. Rarely

33. Is the refuse dump too high up? A. Yes B. No

34. Do you pay as you dump? A. Yes (if yes) how much? GHC.....day/week/month

B. No

35. Is the refuse dump very far from your home? A. Yes B. No C. It's normal

36. What challenges do you face in managing wastes? Time constraints Distance is far

C Financial constraints I). Lack of better containers E. Others.....

