UNIVERSITY OF EDUCATION, WINNEBA

COLLEGE OF TECHNOLOGY EDUCATION, KUMASI

EXPLORING SOLID WASTE MANAGEMENT IN THE HOTEL INDUSTRY IN GHANA: A CASE STUDY OF SELECTED HOTELS IN THE ACCRA METROPOLIS

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AUGUST, 2017

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METROPOLIS

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A project report in the department of HOSPITALITY AND TOURISM, Faculty of

VOCATIONAL EDUCATION, submitted to the School of Graduate Studies, University

of Education Winneba, in partial fulfilment of the requirements for award of the

Master of Technology (Catering and Hospitality) degree.

AUGUST, 2017

DECLARATION

I, LYDIA BAAH declare that this project report, 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:……………………...................……….…….

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of Project report as laid down by the University of Education, Winneba.
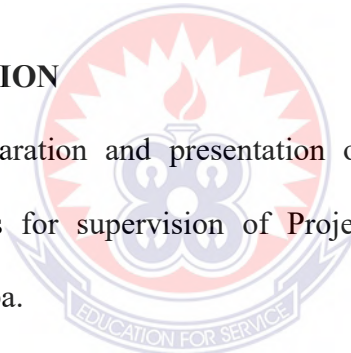
NAME OF SUPERVISOR: GILBERT OWIAH SAMPSON (Ph.D)

SIGNATURE:………………...................………….

DATE:……………………………...................…..

ii

ACKNOWLEDGEMENT

DEDICATION

This piece is dedicated to my lovely children Nana Kwabena Okai-Mensah, Nana Kwadwo
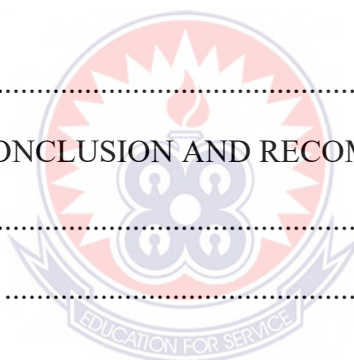
Okai-Mensah and Nelly Ewurakua Okai – Mensah.

TABLE OF CONTENTS

LIST OF TABLES

Table   **Page**

LIST OF FIGURES

ABSTRACT

Solid waste management is a challenging and complex task. The problem is more pronounced in the hospitality industry due to the nature of the services they provide and a reliance on consumable goods. To this effect, the researcher conducted this study to explore the solid waste management practices of hotels in the Accra. The specific objectives of the study were to; analyse the hotel solid waste management practices in the hospitality industry, to bring out the challenges associated with solid waste management in the hospitality industry and to find out the effects of poor solid waste management on the hospitality industry and the environment as a whole. The study used the descriptive survey approach and collected data quantitatively to solve the research problem. The population of the study consisted of 3-star rated hotels and above in the Accra Metropolis out of which a sample of four hotels was made. The study used purposive sampling to select the hotels and staff of the hotels. A total of 80 participants were selected from the four hotels which are Movenpick Ambassador Hotel, Golden Tulip Hotel, Airport View Hotel and La Palm Royal Beach Hotel. Questionnaire was the main research instrument used to collect data for the study. The study found that food waste constitute majority of waste in the hotel sector and waste management is mostly (100%) done through disposal or dumping at landfill sites. It was also found that various challenges plague the waste management process such as high financial costs, little or no technology, lack of government support and labour intensiveness. The effects of improper waste management were found to be negative word of mouth for hotel (100%), breeding of insects and pests that carry disease causing organisms (100%), flooding (85%) and offensive odours (77.2%). The study recommends that government should enact legislation that makes it mandatory for hotel managers to recycle part of their waste. Also, institutions should be set up to provide the necessary technical training to enable firms practice integrated waste management.

CHAPTER ONE

INTRODUCTION

1.0 Background to the Study

The hospitality industry is one of the fastest growing around the world due to impacts of globalisation and industrialisation. The significant contributions of the hospitality industry that comes along with the expansion in the hospitality industry in terms of growth in national development, infrastructure and employment cannot be overemphasized. However, this expansion in the hospitality sector operations is accompanied by an expansion in its waste generation and management operations. The hospitality and tourism industry have both positive and negative impacts on people and the environment. Some of these benefits include economic activity and employment opportunities. The negative impacts include deterioration of natural resources and contributing to existing problems such as increasing quantities of solid waste (Tribe, Font, Griffiths, Vickery and Yale, 2000).

More waste usually translates into a greater environmental challenge and therefore more harm to the ecosystem. For example, it is estimated that a hotel guest generates up to 1kg of waste per day on average (International Hotel Environmental Initiative, 2002), and this amounts to millions of tons of waste being generated worldwide annually.

In developing countries such as Ghana, sustainable environmental management has often been relegated to the background in the haste to achieve economic development, resulting in pollution, sanitation problems, intensified urban congestion and resource depletion (Middleton & Clarke, 2004). Solid waste management is one of the serious, complex and challenging problems in developing countries and Ghana is no exception.

The hotel industry the world over is faced with the problem of solid waste and how to effectively manage such waste to minimise its negative impacts on the environment and humankind. Solid waste is undesirable and left-over substances or materials. These materials cannot be reused directly by the society because of its ill effects (Foster, Sampson & Dunn, 2000). Most of the waste materials pose hazardous or negative effects on human health. In the hotel sector, the typical solid waste generated are vegetable waste, fruit waste, left-over cooked food, plastic waste, paper waste, aluminium waste, etc. In the hospitality sector, the cost of solid waste management includes various factors such as the disposal and transport of waste as well as the associated labour costs (Todd & Hawkins, 2003). 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 use large quantities of consumer goods as part of their operations (Bohdanowicz, 2005). Generation of solid waste and related services like collection, transportation, processing and final disposal of waste are important both in terms of health of the public and environment.

Human beings need resources to live and carry out our life processes. The resources humans consume leave residues of by-products which results in the inevitable generation of waste. Waste generation is inevitable and so is waste management. Admittedly, urbanisation and growth in the hospitality industry culminating in the increasing demand for goods and services has impacted on waste generation. This calls for a commensurate effort on the part of hospitality managers and authorities to appropriately tackle and manage the waste generated (Narayana, 2008; Oteng-Ababio *et al.*, 2012).

Improper management of solid waste has considerable adverse effects on the health of staff and also the community associated with dealing in solid wastes. Ghana is bedevilled with

inadequacy of efficient systems to manage solid wastes particularly in cities and urban areas (Twumasi & Kosoe, 2014).

Fobil *et al*., (2010) argued that the lack of well thought management plan for solid waste collection and disposal in most developing countries is a major drawback for efficient management of solid waste in the hospitality industry of these countries. The efforts being made in Ghana have focused mainly on the collection and disposal of solid waste which does not cover the entire functional elements of solid waste management. These elements encompass generation, on-site storage, collection, transfer and transport, disposal, processing and recovery (recycle) of solid waste (Tchobanoglous, *et al*., 1993).

The solid waste generated due to the human activities cause enormous environmental damages to the environment. Improper management of waste further creates a risk to environment and human health because of insanitary conditions (Narayana, 2008).

Management of waste is more important for the ecological balance and to maintain human health. Managing waste positively affect social, economic and environmental issues of countries and organization (Blume, 2009). It is indeed acting as an effective tool for the hospitality industry as more and more hotels today are resorting to the effective resource management practices and reaping the rich monetary benefits from the available limited resources. Green practices maintain the ecological balance with business processes. This research focus on issue of waste generation from hotel industry along with various challenges and opportunities when identified and addressed will highlight ways to deal with these issues to achieve profitability and sustainability.

According to research, (Razeto & Hemelryck, 1991) some of the sustainable ways of dealing with waste management is composting and recycling. For thousands of people in developing countries struggling against poverty, informal waste recovery represents a means of earning a

3

living. Informal recycling networks provide employment opportunities, reduce collection and disposal costs, conserve natural resources and provide raw materials to industry at comparatively lower costs (Jindal, *et al.,* 1998).

1.1 Statement of the Problem

The hotel industries in Greater Accra are sources of solid waste generation since a large chunk of waste is generated from lodging, storing and kitchen operations. Waste collection systems are not usually managed by the hotels in Greater Accra, the staff disposed the waste wherever possible mostly in the drainages or at the river banks. This has led to huge environmental pollution deteriorating the health of mankind and the other living beings. Due to the lack of knowledge of disposing the wastages, the hotel staff trash the waste generated whatever way they wanted. Due to this situation, waste is always generated around the city of Accra including in the roads, play grounds, and even parks. The hotel staffs throw the waste generated without realizing that it is affecting their own health.

Most hotels in Greater Accra do not have effective systems such as for segregation, recycling and composting. Presently there are improper waste management practices in the hotel industries, in most hotels in Accra, lack of suitable facilities (equipment and infrastructure) and underestimates of waste generation rates, inadequate management and technical skills, improper collection, and route planning are responsible for poor collection and transportation of waste. The adverse impacts of poor management of waste by hotels in Greater Accra on human beings are in the form of various communicable diseases such as diarrhoea, jaundice, skin diseases, cholera, malaria, lung diseases, and so on. Against this backdrop, the researcher seeks to assess the waste management practices of hotels in the Accra Metropolis

4

using selected hotels as the case study and recommend effective waste management practices for hotels in the industry.

1.2 Main Objective of the Study

The study is conducted with the main objective of investigating into solid waste management practices in the hotel industry using Accra Metropolis as the study area.

1.2.1 Specific Objectives

The study seeks to achieve the following objectives:

1. To analyse the hotel solid waste management practices in the hospitality industry.
2. To bring out the challenges associated with solid waste management in the hospitality industry.
3. To find out the perceived effects of poor solid waste management on the hospitality industry and the environment in general.
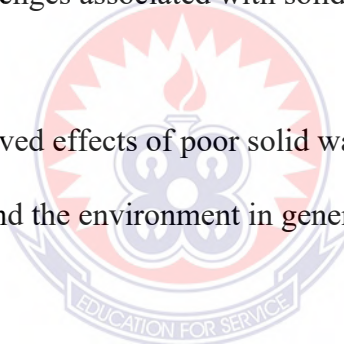
1.2.2 Research Questions

The research is guided by the following research questions:

1. What are the solid waste management practices in the hospitality industry?
2. What challenges do hospitality operators encounter in the management of their solid waste generated?
3. What are the perceived effects of poor solid waste management on the hospitality industry and the environment in general?

1.3 Significance of the Study

In general, few literature is available on how to implement integrated approaches to solve the problem of solid waste management in the hospitality sector in Ghana. This thesis will therefore serve as a relevant literature which will provide information on the various issues associated with waste generation and management in the hospitality sector. Again, the study will seek to present suitable measures from stakeholders in the industry which could be implemented to mitigate the problem at hand.

This study addresses several research needs by providing a case study which is evaluated in comparison with environmental management concepts, thereby helping to increase general understanding of solid waste management in the hospitality industry in developing countries. Again, through this study and the sharing of experiences and lessons learnt by others, a better understanding of solid waste management in the hospitality industry will be created which will inspire the development of innovative ideas and actions.
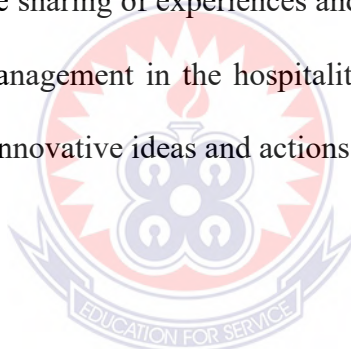
1.4 Scope of the Study

The general span of the study was to determine methods and policies of effective waste management being practice at in the hospitality industry, especially hotels, in Ghana. However, the study covered only 3-star rated hotels and above in the Greater Accra Region of the country. The reason for choosing such hotels to conduct the study is because hotels that have this rating (3-star and above) receive a lot of guests and is therefore expected to produce a lot of waste. Also, the hotels offer their clientele more than just basic services. As such, it is expected that hotels of such standing has a lot of supplies being made to them therefore calling for policies and practices to manage the resultant waste effectively. The region and hotels was selected because of its exclusivity and amount of expected waste generated by

such an establishment. The findings and the contributions however can be generalised to the national level.

1.5 Definition of Terms

AMA – Accra Metropolitan Assembly

ISO – International Organisation for Standardisation

NGO – Non Governmental Organisation

SWM – Solid Waste Management

HSWM – Hotel Solid Waste Management

UNEP – United Nations Environment Programme

EMS – Environmental Management System

4Rs – Waste Reduction, Reuse, Recycling and Recovery

1.6 Organisation of the Study

This work is made up of five chapters. Chapter One deals with the introduction of the study. It states the very problem under study, the purpose of the work, the objectives of the study and the research questions on which the whole study revolves. It also talks about the significance of the study, delimitations of the study and how the study is organized. Chapter Two provides a comprehensive review of literature on the topic under study. This will help the researcher to understand the views of other researchers and research works on waste generation and management in the hospitality industry and identify knowledge gaps in literature.

Chapter Three is devoted to the research methodology used in the conduct of this research. It discusses the instruments for the collection of data and the overall research design adopted

for the study. Chapter four presents the analysis of data. All the data collected for the purposes of the study are analyzed in this chapter. Chapter Five is the final chapter of the study. Recommendations, suggestions and conclusions are made in this chapter to conclude the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The purpose of this study is to investigate the effective waste management in the hotel industry in Ghana using Accra Metropolitan Area as the case study. In line with the purpose, the literature review in this chapter is organised around the following sub-themes; development of the hotel industry, general overview of waste in the hospitality industry, impact of waste generation and poor waste management on the environment, waste management practices in the hotel industry and challenges associated with solid waste management in the hospitality industry.

2.1 The Development of the Hotel Industry

The hotel industry is as essential as other service-based businesses such as transport and retail because it has the mission to accommodate people travelling away from home. In a lot of examples around the world, the hotel itself could be a tourist attraction as well. Furthermore, hotels act as important foreign currency earners, especially for countries with limited export possibilities (Bardi, 2003).

For countries dependent on tourism, hotels are usually huge employers for local people, where the job opportunities increase with the scale of the hotel. The hotel industry also indirectly helps the regional economy by purchasing various items like food and beverages, furniture, and other consumables. Not only do the hotels provide various services for tourists, modem hotels are also considered as catering alternatives for local people, especially when people look for fine dining (Medlik and Ingram, 2000).

9

The concept of hospitality is extremely old; it is mentioned in writings dating back to ancient Greece, ancient Rome and Biblical Times (Chan and Mackenzie, 2009). The history of hospitality is intimately connected to that of civilisations, or rather, it is a part of that history. Facilities offering guests hospitality have been in evidence since ancient times through early biblical times. The Greeks developed thermal baths in villages designed for rest and recuperation. Later, the Romans built mansions to provide accommodation for travellers on government business. The Romans were the first to develop thermal baths in England, Switzerland and the Middle East. Later still, caravanserais appeared, providing a resting place for caravans along Middle Eastern routes. In the middle Ages, monasteries and abbeys were the first establishments to offer refuge to travellers on a regular basis. Religious orders built inns, hospices and hospitals to cater for those on the move (Bardi, 2003).

Two possible explanations of why ancient times' people felt required to be hospitable: they felt that hospitality to strangers was necessary to their religious well-being and in others, they were hospitable only because of their own superstitious fears. Therefore, we find either religion or the supernatural as the principal motivating force in the concept of hospitality (Chan and Mackenzie, 2009). Hospitality in ancient Greece is understandable that certain elements of religion were intermingled with the idea. Missionaries, priests, and pilgrims formed a very large part of the travelling public. Often they were journeying to holy places, perhaps oracles or temples that had a dominant position in their religion.

During the Roman era, travelers who were not on the road for religious reasons were usually on military, diplomatic or political missions. Many military travelers disdained using the accommodations that were available along the route. Inn in the cities was of bad reputation

10

and detrimental to travelers; outside the cities, they neither existed nor were needed. The military travelers preferred, therefore, to sleep in the tents they carried with them.

In ancient Persia, travelling was done in large caravans, which carried elaborate tents for use along the caravan routes. However, at certain points on these routes, accommodations known as Khans were constructed. These were simple structure consisting of four walls that provided protection not only against natural elements but also against enemies who attacked under cover of darkness.

In the later years of the Roman Empire, taverns and inns provided shelter for travelling merchants, actors, and scholars. Accommodations were still primitive. Sometimes there were rooms for the people but no stables for the horses; more often there were stables but no rooms. The high spot of that era in terms of hospitality was the development by the Persians of posthouses along the caravan routes. These developed later than the khans and provided accommodations and nourishment for both soldiers and couriers. Marco Polo described the posthouses known as yams as apartments suitable for a king. They were located 25 miles apart, perhaps equivalent of a day's ride, and supplied fresh horses for the couriers carrying messages throughout the land. By Marco Polo's estimate, there were 10,000 such posthouses in existence at the time of his journey to the Far East (O'Gorman, 2010).

During the Middle Ages, it was considered as the duty of the Christians to offer hospitality to travelers and pilgrims. Monasteries functioned as inns, providing accommodations and food for the weary traveler. Some monasteries and churches, concerned perhaps with the invasion of private meditations by the traveling public, constructed a separate building to

11

accommodate travelers. These building were known as *xenodocheions*, a Greek word meaning inns or resting places (O'Gorman, 2010).

Charlemagne during his reign enacted laws setting out the duty of a Christian to provide a free resting place for a traveler. However, in consideration perhaps of the possibility that a traveler might overstay his welcome, and also the burden of providing free food for an indefinite period of time, the law limited the stay of any traveler in any place to three nights. In 1282 in Florence Italy, the great innkeepers of the city incorporated an association for the purpose of turning hospitality into a business (Chan and Mackenzie, 2009).

Inns became licensed and were permitted to import and resell wine. The inns themselves belonged not to the innkeepers but to the city, and they were operated under three-year leases, which was sold by auction. In the year 1290, 86 inns in Florence were members of the guild. Shortly thereafter, the business of hospitality spread to Rome and other Italian cities. It is interesting to note that during that period many of the innkeepers were German rather than Italian - possibly because many of the merchants who were traveling were themselves German and were eager to find accommodation where they would find their own language and food they were accustomed to (Chan and Mackenzie, 2009).

Between the 16th and 18th Centuries, considerable improvement took place, particularly in England, in the quality of accommodations. The common mode of transportation used then was stagecoach. Stagecoaches were forced to make overnight stops on long journeys. These called for not only food and rest for the horses but also food and accommodations for the passengers. A direct result was the construction of inns or taverns at suitable locations along the stagecoach routes. Since the passengers were mainly wealthy people, accustomed to

certain luxuries, the stagecoaches contributed not only to growth in the number of inns but also to improvements in their quality.

The inns or taverns also became popular meeting places for local nobility, politicians, priests and others. License for the inns were issued by the local lord or knight whose territory the inn lay. The design of the inns was in the form of quadrangle, with stagecoaches and people entering through a vaulted gateway. The yard within the quadrangle was used for many purposes, such as weddings. The quadrangular form provided outside was easy to control and protect. The various buildings or sections within provided sleeping accommodations for the travelers, a faculty in which food and drink was served, and shelter for both the drivers and the horses. In the 18th century, coffeehouses became extremely popular in Europe and were incorporated into many of the inns. Hotel de Henri IV was built in Nantes in 1788 at a total cost of £17, 500. It had 60 beds and was considered the finest in Europe at that time (O'Gorman, 2010).
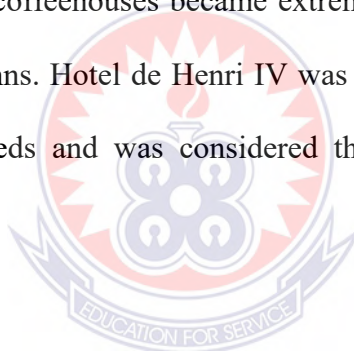
According to Bardi (2003), the modern hotel that people are familiar with nowadays first appeared in the US in the beginning of the 20th century. Limited service hotels where the hotels provided only sleeping accommodation and limited service of refreshment to the travellers, appeared in the industry in the 1950s when hotels started expanding from centre-city area to the suburbs. This type of hotel was especially popular in the countryside or at intermediate stops along cross-country highways and remained one of the major sectors in the hotel business. Meanwhile, the nature of the hotel industry changed from family-based business to international corporation, which usually exhibits a complicated organisation and has well-established management system.

There are two fundamental services offered by the modern hotels, namely guest room accommodation and catering service, which are in fact aiming to satisfy two very basic human needs for the travellers: to sleep and to eat away from home. It seems to be straightforward business, but indeed it requires a lot of expertise to make a successful hotel (Jones, 1996). Almost every modern hotel provides these two basic services; however, a majority of the hotels offers a lot more to their respective guests, as well as to the local people and other business groups. Thus, the organisation of hotels differs from one to another, depending on the variety of services provided, the scale of the business, and the types of facilities exhibited.

2.2 General Overview of Waste in the Hospitality Industry

Waste is often said to consist of material or non-material things that are no longer required by the user or producer or, as some people would say, "anything being discarded". These discarded things may be classified in several ways such as commercial, industrial, household or clinical waste (Furedy, 1997). The "unwanted material" may exhibit characteristics that require correct management. Waste production is often unavoidable. It therefore becomes absolutely important to investigate ways of minimising its continuous generation as well as acquainting oneself with the various management options.

In one understanding, waste management is defined as the collection, transportation, storage as well as the recycling and disposal of waste including the care of deposal sites (Mukosa, 2001). Waste management has now emerged as a dominant urban environmental issue in many countries. Most cities in developing countries are grappling with the problem of the collection and safe disposal of various types of wastes. Although, still a relatively new phenomenon in environmental protection, waste management has come to occupy the

forefront of political agendas in a number of countries like Ghana. this study focused on waste management in the hospitality industry because it is a critical aspect of that industry. Solid Waste Management (SWM) is one of the serious, complex and challenging problems in developing countries that NGOs (such as EPA) have identified as a strategic way of addressing environmental and social concerns (Furedy 1997).

Food waste is 'any food that is not consumed by humans and can be generated at any level within the food chain' (Okazaki, *et al*., 2008). For the purpose of this study, food waste is defined as any food discarded as part of operations in the hospitality sector. This could be packaged food that is thrown away as it has passed its expiration date, food preparation/processing wastes, and waste from serving dishes and guests' plates. Food waste can father be divided into avoidable (food that was edible before it was thrown away) and possibly avoidable (food that is eaten by some but not by others, or a single type of food that may or may not be waste depending on how it was prepared) and unavoidable waste. The avoidable and possibly unavoidable waste may therefore be considered to be edible (Parfitt, *et al*., 2010).

2.2.1 Classification of Wastes in the Hospitality Sector

Generally speaking, waste from the hospitality industry consists of both wet (organic/biodegradable) and dry waste. The wet waste consists primarily of food waste

15

(Wagh, 2008), which can account for more than 50% of the hospitality waste (Curry, 2012) and up to one third of all the food served within the hospitality sector (Marthinsen, *et al.,* 2012).

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 (Bohdanowicz, 2005). The large amounts of food waste generated by the hospitality sector can also not be ignored. Various studies have shed some light on the typical waste types generated at hotels. For instance, aluminum, plastics, glass, steel, cardboard and food waste were cited as being the main components of hotel waste in some studies (Axler,1973; Kirk,1995). As per another study (Zein *et al*., 2008), the components of hotel waste along with their sources are shown in Tables 1 and 2, which show non-hazardous and hazardous types of waste, respectively. It must be remembered, though, that these are not exhaustive lists of the components, although they do mention all of the most significant components. For instance, sometimes hotels produce other types of wastes, such as bulky items (e.g. furniture), construction and demolition waste (e.g. concrete, pipes, etc.), discarded electronics and office appliances, and used refrigerating equipment (Zein *et al*., 2008).

From the environmentalist point of view, waste from hospitality industry is classified under two broad categories. These categories are the hazardous and non-hazardous wastes. Tables 2.1 and 2.2 present the sources of these two kinds of waste and their constitution.

Table 2.1: Types of non-hazardous wastes in the hotel industry

Non-hazardous waste type	Components	Source
Household wastes	Food/kitchen waste, used or dirty paper and wrapping, plastic wrapping or bags, composite wrappers	Hotel's different departments
Cardboard	Packaging	Hotel's purchasing and other departments
Paper	Printed documents, brochures, menus, maps, magazines, newspapers	Administration, reception, guest rooms, restaurants
Plastic	Bags, bottles (that did not contain hazardous material), household goods, individual portion rappers for various products	Kitchen, restaurants, bars, guest rooms, administration
Metal	Tin cans, jar lids, soda cans, food containers, mayonnaise, mustard and tomato puree tubes, aluminium packaging	Kitchen, restaurants, bars, guest rooms
Glass	Bottles, jars, flasks	Kitchen, restaurants, bars, guest rooms
Cloth	Tablecloths, bed-linen, napkins, clothes, rags	Kitchen, restaurants, bars, guest rooms, bathrooms,
Wood	Wooden packaging, pallets	Purchasing department
Organic waste	Fruits and vegetable peelings, flowers and plants, branches, leaves, grass	Kitchen, restaurants, bars, guest rooms, gardens

Source: Zein, *et al.,* (2008).

Table 2.2: Types of hazardous wastes in the hotel industry

Hazardous Waste Type	Source
Frying oil	Kitchen, restaurants
Mineral oil	Maintenance service
Pain and solvent residues	Maintenance service
Flammable material (gas, petrol, etc)	Kitchen, garden, maintenance service
Fertilisers and chemicals (insecticides, fungicides,	Garden

herbicides)	
Cleaning chemicals	Maintenance service
Ink cartridges	Administration
Computer Disks and CD's	Administration, guest rooms
Batteries	Maintenance service, administration, guest rooms
Cleaning chemicals and solvents used in dry cleaning	Laundry room
Fluorescent lights, neon tunes and long-life bulbs	Maintenance service

Source: Zein, *et al.,* (2008).

2.2.2 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 (front-of-house, back-of-house, etc.), 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 and 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). For example, the Radisson SAS hotels have reported an average of 3.1 kg of unsorted waste/guest-night chainwide. This is much greater than the chain-wide average for Scandic Hotels (located in Sweden, Denmark, Finland, Norway, Germany, the Netherlands, Belgium and Poland), which reported an average of 0.515 kg of unsorted waste/guest-night (Bohdanowicz, 2006).

In addition, a study of 52 hotels in Ghana found that larger properties with higher star 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). A study which looked into the implementation of environmental sustainability innovations in 49 hotels and ski resorts in North America found that simpler innovations were more often implemented and persuasive property managers were found to have the greatest effect on the implementation of such innovations.

Other significant factors were the perceived relative benefits of the innovation and the hotel's general innovativeness (Smerecnik and Andersen, 2011). In terms of the perceived benefits of green business practices from the perspective of a property manager/owner, another study carried out in the USA (Nicholls and Kang, 2012) found that the most important benefits were the improvement of the property's image, the improvement in the relationship with the local community, an increase in customer satisfaction, the marketing advantage over competitors, increased profitability, and the increase in employee satisfaction, in descending order of importance. Yet another study involving 190 Vietnamese hotel managers found that innovation characteristics and "external environment characteristics" such as observability and perceived competition, respectively, had a greater effect on the adoption of environmental practices by hotel managers.

In contrast, characteristics such as the size of the hotel and its location weakly influenced the adoption of environmental practices (Le *et al*., 2006). In addition, with respect to how hotel executives rate the importance of different issues when it comes to implementing a solid waste program, a study carried out in the United States found that, among several factors, waste disposal fee was the most important factor. This was followed by a positive public image and then legislative restrictions. The least important factors were corporate policy and guest/community demands (Shanklin *et al*., 1991). 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). As an example, restaurateurs in Japan have urged the state to be more proactive if they would like to see the restaurants implement ecofriendly practices in a more effective manner (Kasim and Ismail, 2012).

2.2.3 Waste Minimisation 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. Fig. 1 shows a proposed version of this waste management process. This figure was created after consulting various literature, primarily Radwan *et al*. (2010, 2012). 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.

The process outlined in Fig. 1 integrates green purchasing as one of its steps. Green purchasing (also referred to as "purchasing with Eco-Intelligence" (Cummings, 1997) is defined as "the purchase of products and services that have a lesser or reduced effect on human health and the environment when compared with competing products and services that serve the same purpose" (Remolador, 2011). Green purchasing can be applied in the hospitality sector for products such as office supplies and cleaning products. Using such green products also tends to lead to a smaller amount of waste generation due to the fact that they are not as packaging-intensive and the packaging that they do have is recyclable. For example, in the case of most types of paper, it is advisable to buy products with a minimum of 20% post-consumer content (Snarr and Pezza, 2000). Yet another notable feature of the process described in Fig. 1 is the fact that it clearly makes it compulsory for the hotel/restaurant staff to be trained about the property's waste management strategy. Indeed, a green waste management strategy cannot be executed without the cooperation of the staff, and so they must be trained accordingly.

Prevention

Reduce

Reuse

Recycle

Composting

Energy Recovery

Landfilling

Most favoured option

Least favoured option
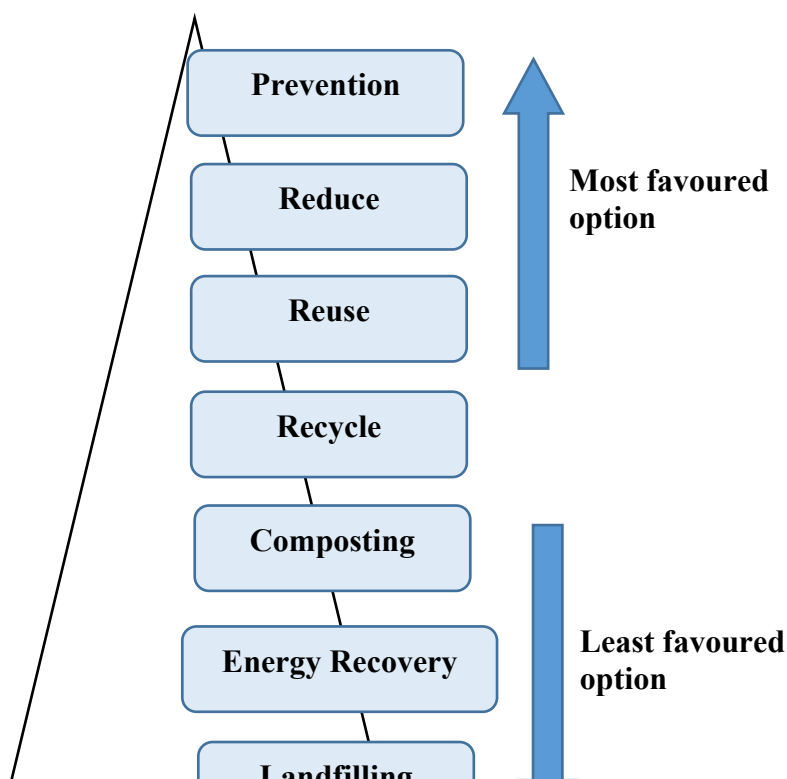
Figure 2.1: The Waste Hierarchy

2.3 Impact of Waste Generation on Environment and Economy

2.3.1 Environmental Impact

In developing regions of Africa and Asia such as Indonesia, improper disposal of solid waste is a major source of environmental pollution (Listyawan 1997). Wisnu (1999) estimated that 60% of solid waste is not collected or disposed of properly, and is instead dumped in "informal" landfills, the ocean or along the side of roads. The need to improve public cleansing and solid waste management has gained the attention of citizens, government and industry in Indonesia (Listyawan, 1997).

Waste is unsightly and malodourous, polluting land, air and water, clogging drainage systems, posing serious public health risks, and restricting potential land use (Pernia 1992; Haan, Coad and Lardinois 1998). Spontaneous ignition of gases and deliberate burning are common at dumpsites (Thomas-Hope, 1998). The burning of garbage releases smoke and hazardous substances. Leachate from the waste can contaminate soil, surface water and groundwater. Mosquitoes that can carry dengue fever and yellow fever breed in fresh water from accumulated rainfall in cans and bottles (Pinnock, 1998).

23

Disease vectors such as mosquitoes, flies, cockroaches and rodents thrive on solid waste (Pinnock, 1998). The pathways of direct and indirect contact identified include insects, rodents, pigs, birds, air and water pollution, and food contamination (Pinnock, 1998). Similarly, Fedorak and Rogers (1991) identified three mechanisms by which micro-organisms could be disseminated from a waste disposal site. The first mechanism was leachates into groundwater, the second was airborne particles, and the third was life forms that consume or pick up microbes. Waste such as facial tissues, pet faeces, soiled diapers and putrescible food may contain large numbers of micro-organisms (Fedorak and Rogers, 1991).

In developing countries, amenities for workers' welfare are normally absent (Jindal et al. 1998). People working in the waste management sector can encounter a number of work related health concerns such as pain, illness, stress, injuries, accidents and emergencies. Waste pickers at dump sites report numerous negative health effects, such as eye irritations, respiratory diseases, asthma, leg cramps, backache, pain in arms, dental problems, parasitism, intestinal disorders, diarrhoea, skin diseases, severe headache, lacerations, puncture injuries, minor accidents and mental health problems (Lohani and Baldisimo, 1991; Pinnock, 1998). Factors that contribute to these ailments include unsanitary conditions (smoke, dust, faecal matter, rats, insects), unhealthy practices (food contamination), heavy loads, handling operation, mechanised equipment, nature of the materials handled, extent to which safeguards are employed (gloves, boots, etc.) and availability of cleaning facilities (Lohani and Baldisimo, 1991; Lardinois and van de Klundert, 1995; Pinnock 1998).

Workers often do not use safety equipment such as facemasks, ear plugs, gloves and proper footwear, and there is a need for education about health and safety issues (Thomas-Hope, 1998). The lack of precautions, unsafe practices, noise, high temperatures, polluted atmosphere (dust, hazardous chemicals), contaminated waste, and long working hours in

24

many working areas present serious health hazards (Lardinois and van de Klundert, 1995; Habitat, 1994). There is a need to improve standards and strengthen labour and health regulations, however, even when regulations exist, many informal recycling activities do not comply with them (Lardinois and van de Klundert, 1995). Lack of enforcement of legislation is a common problem in Asian developing countries (Jindal, *et al.,* 1998).

2.3.2 Economic Impact

In large cities in Africa and most developing countries like Lagos, Abuja, Accra, on average around US$15 million is spent annually on waste collection and disposal per city (Habitat 1994). The collection and transportation stages are usually the most expensive components of the system (Jindal *et al.,* 1998). Although municipal governments spend 30-50% of their operating budgets on solid waste management, they are generally able to collect only 60-70% of the solid waste in cities (Habitat, 1994).

Waste recycling can reduce waste disposal costs for local authorities by extending the life of landfills, reducing the need to invest in transport vehicles and equipment, reducing vehicle operation and maintenance costs, and reducing fuel consumption for transporting waste (Habitat 1994). Businesses are provided with cheap raw materials. In several countries, steel, paper and glass industries are dependent on recycled materials (Jindal, *et al.,* 1998). The use of recycled materials reduces the need to import raw materials, meaning that less money is spent on foreign currency. Banning the import of foreign waste helps prevent the destruction of local markets for recycled materials, and the health and environmental problems associated with contaminated waste (Habitat, 1994).

Local conditions affect the attractiveness of recycling for local entrepreneurs. The costs associated with using recycled materials can be higher than those for virgin materials if virgin materials are available in concentrated form and have a more homogeneous composition (Jindal *et al.*, 1998). It is easiest to find markets for high quality, readily accessible waste materials. Mixed, contaminated, low value waste materials offer less potential for recovery and reprocessing. A recycling rate of 7.5% results in an annual cost reduction of over US$1 million in each city, therefore, the potential cost savings from improving the recycling rate are even greater (Habitat, 1994). An estimated 1% of the urban population is involved in the recycling sector, however, if the recycling system were to be developed to its potential, as much as 2-3% of the urban population could be employed in recycling activities (Habitat, 1994).

Recycling is a labour-intensive activity with relatively low start-up costs, providing opportunities for employment and income generation for a great number of people as waste pickers, itinerant waste buyers, waste dealers, workers in recycling businesses, business managers and entrepreneurs (Lardinois and van de Klundert, 1995). Waste recycling often serves as an entry point into the urban economy, providing participants with economic benefits, higher social status, on-the-job training and business opportunities (Marti, 1991; Panwalkar 1991).

26

2.4 Key Concepts for Solid Waste Management

Conceptual tools relevant to forming a private sector approach to sustainable SWM in developing countries will be reviewed in this section. The concept of appropriate technology is a response to past failures of conventional Western technical approaches that did not adequately consider local conditions and complexities. Cleaner production and life cycle assessment involve looking beyond "end-of-pipe" solutions by considering impacts from "cradle-to-grave". Environmental management systems provide a planning framework that can integrate concepts such as appropriate technology, integrated waste management, cleaner production and life cycle assessment into systems for managing waste.

2.4.1 Appropriate Technology

For the effectiveness and overall success of any waste management programme as a part of urban and rural planning in developing countries, the key concept is appropriate technology (Jindal, et al., 1998). Western countries have provided assistance in SWM to developing countries with the narrow view of SWM as a technical problem. The logic of donor countries can be summarised as follows:

1. They have a solid waste problem

2. We have solved our solid waste problem with this machinery

3. If we supply this machinery, their solid waste problem will also be solved (Haan, Coad & Lardinois, 1998)

But the mere 'blind technology transfer' of machinery from western countries to developing countries has brought attention to the need for appropriate technology (Jindal, et al., 1998).

27

Quick solutions involving complex machinery from industrialised countries are often inappropriate for developing countries that may lack the resources for proper operation and maintenance (Haan, Coad & Lardinois, 1998).

For the transfer of technologies to be successful, the conditions in developing countries must be considered, such as widespread unemployment, low wages for unskilled labourers, and shortages of organisational capacities, trained and experienced professionals, land, funds and amenities for workers (Ahmad, 1989; Thomas-Hope, 1998).

Successful planning for solid waste management in developing countries depends on the selection and adaptation of appropriate strategies for the context of developing countries (Ahmad 1989; Jindal et al. 1998; Thomas-Hope 1998). Technologies need to be appropriate for the circumstances in developing countries, availability of scientific, technical and financial resources, as well as socio-economic concerns such as poverty alleviation, employment generation, economic growth and reduction of imports (Fernandez, 1997).

For solid waste management, appropriate technology means addressing differences in waste characteristics, using local resources, and selecting simpler technologies, such as small-scale windrow composting instead of mechanised composting plants (Jindal, et al., 1998; Fernandez 1997a). The operating characteristics, performance, training and maintenance

28

requirements, and life-cycle costs of technologies need to be assessed during the technology selection process to determine their suitability (Shubeler, Wehrle and Christen 1996).

Table 2.3: Factors Affecting Solid Waste Management

Factor	Description of Factor
Location and topography	- Type of terrain will affect transportation, storage, treatment and disposal options - Availability of natural resources will affect waste generation
Land area	- Availability of land will affect facilities for waste management
Climate and seasonal cycles	- Temperature, rainfall and humidity will affect the frequency of collection and the breeding of flies and vermin
Population and population density	- Population will affect waste generation and population density will affect how waste is stored and collected
Rural infrastructure	- Rural lifestyle, social and cultural traditions, practices, incomes, education, awareness etc. affect waste generation and disposal practices
Urban infrastructure	- Income level, modernisation, traditions, service charges, type of settlement and littering habits affect waste generation, composition, separation, level of service and disposal practices
Industrialisation	- Industrial developments create wastes that are more complex and toxic in nature
Standard of living	- Higher degree of development, standard of living and consumption of packaged products will increase waste generation and affect waste composition
Economy	- The income of he country will affect the amount of funds available for SWM. - Higher income results in higher consumption level and waste output increases proportionally to growth of the gross national product GNP.

Sources: Claggett et al., (1998); Fernandez (1997); Jindal et al., (1998)

2.4.2 Cleaner Production

Cleaner production involves evaluating and redesigning products, processes and services to obtain environmental and economic benefits. This concept

can be used to expand the scope and role of waste management from dealing with wastes to managing society's resources (i.e., sustainable integrated resource and waste management). Waste management can be regarded as "an interface between the production, distribution and consumption of goods on the one hand, and soil, groundwater, air and climate on the other" (ISWA and UNEP, 2002).

UNEP Industry and Environment introduced the term "cleaner production" in 1989 and defined it as the continuous application of an integrated preventive environmental strategy to processes, products and services to increase eco-efficiency and reduce risks for humans and the environment. Other terms, such as source reduction, waste minimisation, pollution prevention, enhanced productivity and green productivity, convey the same idea as cleaner production, with the aim of considering life cycle impacts, decreasing consumption of resources and production of wastes, and increasing productivity (Park 1996; Huisingh 1989; Yamada 1996). By examining the life cycle of products and services, problems can be identified and processes changed to either prevent or reduce the generation of waste (e.g., using less resources, selecting input materials that are less environmentally harmful, selecting products with a high recycled content). Often, cleaner production options are low-cost housekeeping techniques that require ingenuity and little financing, with payback

periods ranging from less than one year to three years (Boazhong 1996; Huisingh 1989; Yamada 1996).

The anticipated benefits of adopting preventative approaches such as cleaner production include protection of the environment, reduced risks to humans, improved productivity and competitiveness, and reduced costs of governmental regulatory efforts, waste management and clean-up (Huisingh, 1989). Financial benefits can be achieved through decreases in raw materials costs, waste management costs, energy down-time costs, worker health risks, environmental hazards and long-term liability for clean-up of waste materials that might otherwise have been buried (Baozhong, 1996; Huisingh, 1989). A company can benefit from improved product quality, productivity and company public image, as well as increased competitiveness of products in national and international markets (Baozhong 1996; Huisingh 1989).

Countries such as Indonesia are developing programs for implementing cleaner production. The Indonesian environmental impact management agency's (BAPEDAL) Cleaner Production Program will involve activities such as technical assistance, training, guidelines, demonstration projects, and audits. It is hoped that developing countries can 'leapfrog' ahead to the preventative cleaner production approach, and skip the costly end-of-pipe
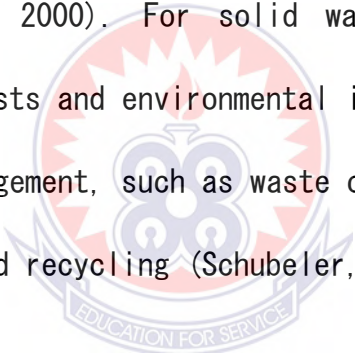
approach. The cleaner production paradigm represents a shift away from end-of- pipe pollution control to pollution prevention. There is a growing awareness within industry and government that end-of-pipe approaches are not as effective or efficient at achieving the goals of cleaner air, land and water as preventative approaches such as cleaner production (Huisingh 1989).

In South East Asia, a major shortcoming of cleaner production demonstration projects has been a lack of self-promoting and sustained adoption of cleaner production (Bunyagidj and Greason 1996). Instead of becoming a tool for continual improvement, cleaner production ends up being a one-time initiative (Bunyagidj and Greason 1996).

Without adequate management, evaluation and auditing techniques, the adoption of cleaner production is not sustained (Bunyagidj and Greason 1996). In response to this failure, Bunyagidj and Greason recommend making cleaner production an integral part of an ISO 14001-certified environmental management system (EMS). An EMS can provide a framework that helps companies incorporate and continuously review cleaner production policies and practices.

2.4.3 Life Cycle Assessment

The consideration of life cycle impacts is an integral part of a cleaner production strategy and can aid in the evaluation of SWM options. Life

32

cycle assessment (LCA) is a tool for analysing environmental effects associated with the life cycle of a product or service. Examining impacts from cradle-to-grave involves identifying environmental impacts (such as air and water pollution, resource consumption and habitat loss) associated with the procurement of raw materials, production, distribution, consumption and disposal. LCA is a decision making tool that can enable the best environmental and cost options to be chosen (UNEP and IH&RA 1996). Applied to the tourism industry, an LCA could be performed to assess the impacts associated with transport, resource use and infrastructure operation (Tribe *et al.,* 2000). For solid waste management, different technologies, financial costs and environmental impacts are associated with each element of waste management, such as waste collection and disposal, as well as waste reduction and recycling (Schubeler, Wehrle and Christen 1996; Thomas-Hope 1998).
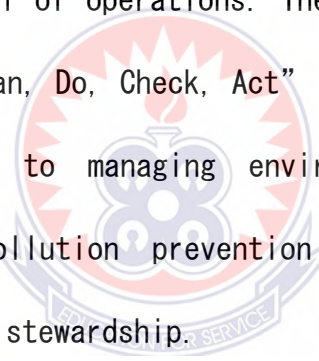
Lifecycle inventories and models (White *et al.,* 1995) have been developed to assess environmental impacts and costs associated with solid waste management. These models can address various sources and types of waste, as well as waste minimisation and treatment options. Use of these models can help the planner of SWM systems evaluate various options based on environmental impacts and costs, however, socio-economic factors (e.g.,

providing employment opportunities) are often not included in these models and may need to be addressed separately.

2.4.4 Environmental Management Systems

Environmental management systems (EMSs) provide a framework that can help organisations incorporate tools such as cleaner production and life cycle assessment (Bunyagidj and Greason 1996). EMSs involve the achievement of environmental goals through the management of environmental aspects in a consistent way. Environmental goals are set by the organisation and achieved through the control of operations. The EMS framework is based on Shewhart and Deming's "Plan, Do, Check, Act" cycle and requires that the organisation be committed to managing environmental issues, ensuring compliance, adopting a pollution prevention approach, and increasing environmental awareness and stewardship.

EMSs can be applied in the absence of industry standards and regulations since they are process-based not performance-based (Rice, 2002). Voluntary approaches such as environmental management systems have been recognised as an effective method of encouraging businesses in the tourism industry to improve their environmental performance in the absence of legislative enforcement (WTTC *et al.*, 2002). However, voluntary approaches have been criticised for legitimising activities that degrade the environment, pre-empting imposed regulations, leading to stereotypical approaches and

34

allowing 'free-rider' companies to gain competitive standing (Forsyth, 1997). Therefore, EMSs may not be a substitute for effective and enforced environmental regulations but they can facilitate compliance and enable organisations to go beyond regulations and adhere to best practices.

2.5 Urban Planning and Solid Waste Management

Solid waste management is a component of urban planning that can involve government, academia, industry, NGOs and communities. Since there are various stakeholders, elements and aspects to consider in SWM, often there is no easy solution. The multiple objectives and challenges involved with planning for SWM mirror the issues discussed in planning literature.

Friedmann (1987) described planning as linking scientific and technical knowledge to action in the public domain, processes of societal guidance and processes of social transformation. Dluhy (1986) described planning as being a technical and political activity, requiring planners to think analytically and politically (i.e., to be both interdisciplinary and interparadigmatic). An interdisciplinary approach to planning is required since planners need to integrate various branches of scientific and technical knowledge to gain insight in addressing complex planning problems. An interparadigmatic approach is needed to understand and integrate various stakeholder perspectives.

There is a diversity of approaches and theories that attempt to describe how planning is done or should be done. The classic rational-comprehensive approach describes problem solving as a series of steps. These steps typically include problem definition, formulation of goals and objectives, comprehensive data gathering for the identification and comparison of

35

alternatives, selection and implementation of the preferred option, monitoring and evaluation. Although the approach is appealing because of its thorough and logical nature, for solving real life planning problems, numerous inadequacies have been identified. Rittel and Webber (1973) described planning problems as "wicked" problems that are difficult to define and the by-product of another problem. The inability of the rational-comprehensive approach to handle "wicked" problems has led to criticisms related to the lack of time and resources for gathering comprehensive information (inadequate knowledge) and multiple competing interests instead of a common interest (conflict).

To address the inadequacy of the rational-comprehensive approach, other perspectives of planning have emerged. These include the incremental, strategic, adaptive and transactive approaches, among others. Lindblom's (1959) incremental approach describes how in reality, people muddle through, considering only a few options that differ slightly from the existing situation. The strategic approach lies between the rational-comprehensive and incremental approaches, and involves focussing on key components and relationships to achieve results. The adaptive approach involves treating initiatives as experiments and learning from experience. The transactive approach described by Friedmann (1973) involves interaction with stakeholders and mutual learning.

Depending on the situation, planners can play a variety of roles. For clearly defined problems, the traditional role of the planner as technical expert, acting in the public's interest and following an orderly, rational approach may be appropriate. For problematic situations, where multiple perspectives, assumptions and potential solutions may exist, the planner may play a mediating role between competing interests, acting as a facilitator and addressing social concerns. This leads to a broader definition of problems and the associated challenges with deciding on priorities and dealing with incompatible expectations.

2.5.1 Solid Waste Planning Process

New forms of participation are required in the management of solid waste in developing countries, as the causes and consequences go beyond the capacity of a single national authority to address them satisfactorily. Management must also equip existing actors and encourage others. In addition to public sector authorities and private companies, the community needs to be involved through citizen associations, neighbourhood groups, local government committees and councils and non-governmental organisations (NGOs) of all types. Whether focusing upon the community or the environment. The activities have then to be carried out within the arrangements of the regulatory frameworks designed for the handling of solid waste as a major aspect of present-day environmental management (Thomas-Hope, 1998).

In the past, the approach to waste management in developing countries was ad hoc, fragmented and uncoordinated, characterised by the notion "out of sight, out of mind" (Claggett et al. 1998; Fernandez 1997a; Thomas-Hope, 1998). There was short-term crisis management instead of long-term planning, a lack of data for planning, and minimal stakeholder involvement in SWM master plans (Fernandez, 1997a). A proactive approach dealing with waste before it is produced, and planning for changes such as economic and population growth, is needed in developing countries to deal with increases in waste generation and pollution (Fernandez 1997; Thomas-Hope, 1998).

An integrated approach has been proposed as a way of addressing SWM (van de Klundert and Anschutz, 2001). Integrated approaches attempt to blend strategic analysis and stakeholder interaction. The role of the planner in integrated approaches involves creating

37

opportunities for interaction among key actors, such that values and preferences are integrated with scientific and technical knowledge (Hart, 1986). The integrated approach to environmental management has also been described as a situation where a "diverse group of stakeholders comes together, shares information and perspectives, fosters mutual understanding, and develops a collaborative approach to managing an environmental system" (Margerum, 1999).

Interaction with stakeholders (also known as public participation) can serve a variety of purposes, such as providing and gathering information (learning process), contributing to a sense of involvement (building support for decisions or redistributing power), and improving the quality of decisions (better services rendered) (Alexander, 1986). Unfortunately, these objectives can be competing, incompatible or conflicting. As in industrialised countries, the NIMBY ("not in my backyard") syndrome is present in developing countries, making SWM a political issue that may not follow the rational comprehensive planning model (Fernandez, 1997).

Models of the planning process for SWM as a series of logical steps have been described by agencies and authors such as the World Bank (Wilson et al. 2001) and WASTE advisers (van de Klundert and Anschutz, 2001). These models are based on the understanding that the planning process must integrate strategic elements, functional waste system elements and stakeholder interests. The model by WASTE advisers explicitly presents opportunities for stakeholder participation. In general, though, both models are examples of the rational-comprehensive approach. As noted by Fernandez (1997), the planning process for SWM in developing and industrialised countries is political, and therefore, may not follow logical steps as described by the World Bank and WASTE advisers.

38

Table 2.4: Planning Process for Solid Waste Management

S/N	Strategic Solid Waste Planning Process (Wilson et al., 2001)	Steps for Developing a sustainable Waste Management System (van de Klundert and Anschutz, 2001)
1	Mobilise the planning process	Start a participatory planning process
2	Define the baseline	Analyse the existing waste management situation
3	Establish the strategic planning framework	Publish and circulate the findings of the analysis
4	Identify and evaluate options	Formulate a draft action plan and budget, including a plant for cost recovery
5	Develop the strategy	Present the action plan to the stakeholders and incorporate their comments and inputs
6	Prepare the action plan	Refine and formulate a final action plan, which is approved by the City council or other legislative body
7	Implement the strategic plan	Implement the action plan and monitor results

2.6 Challenges of Solid Waste Management

Throughout history, human advancement has been intrinsically linked to the management of solid waste due to its effect on both public and environmental health. Solid waste management (SWM) has a long and convoluted history (Nathanson, 2015). Systems of SWM can trace their roots all the way back to ancient times. One of the first instances of waste management occurred in the 4th century A.D. with the Ancient Greeks.

The Greeks had to deal with the multiple challenges of aligning waste removal systems with a growing population, lack of space, and sanitation problems. Waste management practices were very rudimentary with trash just being collected and transported to pits outside the city.

Global production of waste has practically doubled over the past ten years and is expected to reach 2.5 billion tons per year in 2025 as a result of the combined effect of urban development and changes in consumption patterns (Périou, 2012). Communities in developing countries often turn to waste disposal methods that have proven to be destructive to human health and the environment, such as open dumping and burning (or unregulated

landfills) because they feel they have no other options to manage their solid waste (Mwanthi and Nyabola, 1997; Goett, 1998; Alavi *et al*., 2009; Narayana, 2009; Al-Khatib et al., 2015; Hilburn, 2015). With industrial progress, growing urban areas and rapid growth, solid-waste management has become a major concern in many developing countries. A case study conducted in various rural cities in India found that trash was frequently dumped or burned in unregulated areas (Narayana, 2009).

Oftentimes when systems are breaking down and problems are escalating, people look to societal factors to fix the issue. This has often been the case when dealing with the mismanagement of solid waste in the developing world. Many researchers have argued that the waste problem is caused by human behavior and therefore the solution lies in changing that behavior (Milea, 2009). Public awareness and attitudes about waste can affect the whole SWMS (Zhu *et al.,* 2008). How is waste defined in the developing world? Why has littering become such a prevalent behavior in these communities? What role do social norms and attitudes play in shaping these behaviors? And what measures must be taken to ensure that these behaviors change? These are questions that must be answered in order to come to realistic solutions to the problem of solid-waste management in developing countries.

2.6.1 Attitude and Behaviour Gap

Waste can mean many things to different people (Moore, 2012). Some people such as the trash pickers of Ghana see "waste" as a resource or a way to make an income in an otherwise limited job market. On the other hand, you have a majority of people living in the developing world that see waste as a burden and a problem that needs to be addressed. To say people in developing countries don't recognize trash as an issue is an untrue statement. The opposite is often true. However, recognizing trash as a problem does not prevent littering or other

41

negative behaviors concerning waste management (Moore, 2012). This attitude-behavior gap often emerges and can be further affected by a variety of reasons including convenience, social norms, lack of public participation, and lack of education and awareness of effective waste management techniques (Milea, 2009; O'Connell, 2011).

Within this attitude/behavior gap exists an inconsistency between one's values and actions. This specifically refers to the discrepancy between people's concern over the environmental harm posed by household waste and the limited action by those same people to reduce their waste or engage in other pro-environmental behaviors (O'Connell, 2011). Many researchers observed this gap first hand when conducting observations in communities of the developing world.

A negative behavior often associated with the mismanagement of solid waste in developing countries is the occurrence of littering. There are a multitude of causes that can contribute to an increase in public littering rates, such as a lack of social pressure to prevent littering, absence of realistic penalties or consistent enforcement, and lack of knowledge of the environmental effects of littering (Al-Khatib *et al.,* 2009). Other causes also include the amount of litter already present at a particular site, presence of signs referring to litter, and the number and/or placement and appearance (if any) of waste collection bins at the site. Convenience of garbage bins has been cited many times in research as a priority when disposing of trash, and when these are not present or lacking in areas this has been reason enough to litter (Henry *et al*., 2006).

Other times people become accustomed to throwing their waste in streets and other inappropriate places, as there had been no formal system for sorting and disposal in their

community, so when changes are implemented people are not changing their disposal behavior out of pure habit and custom (Yousif and Scott, 2007). Similarly, a range of socio-economic factors can affect public attitudes toward littering, frequency of littering, and the effective approaches to impede the littering tendency within an individual (Al-Khatib *et al*., 2009). These factors are region and culture dependent, and it is very important to study them if an effective littering prevention program is to be designed.

For example, in a study conducted in Cuba looking at the relationship between social norms and pro-environmental behaviors, researchers found that a majority of citizens participated in recycling buybacks and non-littering initiatives, not only because the government supports these efforts for economic reasons, but also because of the social pressure created by the community. Citizens also possess internalized social norms and believe that if they do not adapt their behaviors accordingly, they become outsiders and are looked down on (Mosler *et al.,* 2008).
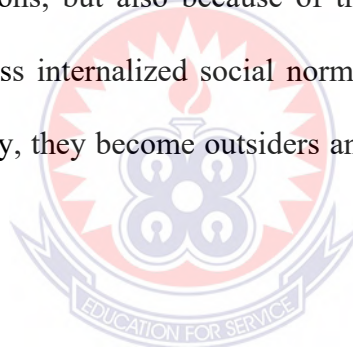
To get a clearer understanding of the complexity of street litter problems, integration between socio-economic and environmental studies is essential (Al-Khatib *et al*., 2009). The participation of the community in the production and use of scientific knowledge is considered the best approach to environmental management of waste. Many studies have been conducted in the developed world to evaluate and apply strategies to reduce littering by means of behavioral interventions (Al-Khatib *et al.,* 2009), but in developing countries little has been done.

2.6.2 Lack of Education and Awareness

Another major constraint seen throughout the developing world is the lack of education and awareness of effective waste-management practices. One study in Gaborone, Botswana, found that even though citizens were aware of recycling and other sustainable waste-management techniques, this does not necessarily translate into participation in pro-environmental activities such as recycling initiatives. They appear to have not embraced waste management reforms amid their limited knowledge of such activities (Bolaane, 2006). The lack of interest in the environment creates a culture of non-participation of communities in decision-making processes. That stance enhances lack of responsibility for pollution and waste issues. Ultimately this produces communities that have little knowledge of, or concern for, their impact on the environment (Poswa, 2001). What it may come down to is the difference between information and knowledge. Being presented with the information without prior knowledge may be ineffective in creating change. However, if prior knowledge of waste management was met with new information, these communities may be more willing to accept it and implement these changes.

The need to improve public awareness of, and community participation in, waste management has been widely recognized by researchers as necessary to create sustainable waste systems and to promote environmental citizenship amongst community members (Lumbreras and García, 2014). Typically, people are more likely to participate in waste management activities, for example recycling, when they observe others in their vicinity recycling. In developing countries recycling programs are rare, so wealthier members of the country rely on informal recyclers as the behavior norm (O'Connell, 2011).

The result of a study done in Malaysia by Aini and colleagues (2002) indicated that, in order to overcome the solid waste crisis, the "conscience of the individual needs to be raised through environmental awareness and concern, inculcation of sustainable consumption practices and education on waste management." Environmental awareness and knowledge about environmental conservation were found to affect recycling attitude positively but positive attitude may not have resulted in recycling if knowledge about it was poor (Aini *et al*., 2002), so waste managers need to take steps to help align the information presented to the public with the knowledge these individuals already have.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1   Introduction

This study was conducted in the Accra Metropolitan Assembly using selected hotels as the case study to investigate the waste management practices in the hospitality industry in Ghana. This chapter of the study presents the methods and methodology employed by the researcher in the conduct of this study. The chapter gives a description of the research approach, methods of data collection, the population and sampling and the instruments used in collecting data.

3.2   Research Design

In the conduct of this study, the descriptive survey approach was adopted using a case study approach in examining the waste management practices and challenges of hotels in the Accra Metropolis. According to Yin, (2003) the selection of a research strategy depends on the type of research questions, extent of control the researcher has over behavioural events and the degree of focus on issues. The researcher used quantitative methods of data collection in order to gather the necessary information relative to the subject under study.

3.3   Study Area

The research area chosen for this study is the Accra Metropolis. Accra is the capital and most populous city of Ghana, with an estimated urban population of 2.27 million as of 2012. It is also the capital of the Greater Accra Region and of the Accra Metropolis District, with which it is conterminous. Accra is furthermore the anchor of a larger metropolitan area, the Accra Metropolitan Area (AMA), which is inhabited by about 4 million people and the thirteenth-largest metropolitan area in Africa. Accra serves as the Greater Accra Region's economic and

46

administrative hub. It is furthermore a centre of a wide range of nightclubs, restaurants, and hotels. Since the early 1990s, a number of new modern buildings have been built, including the multi-storey French-owned Novotel Hotel, Movenpick Ambassador Hotel, Kempinski Hotel, Trassacco El Villagio and the SSNIT Towers. These all have been set up against the backdrop of the city's huge potential for hospitality because the nation's premier airport is situated there.
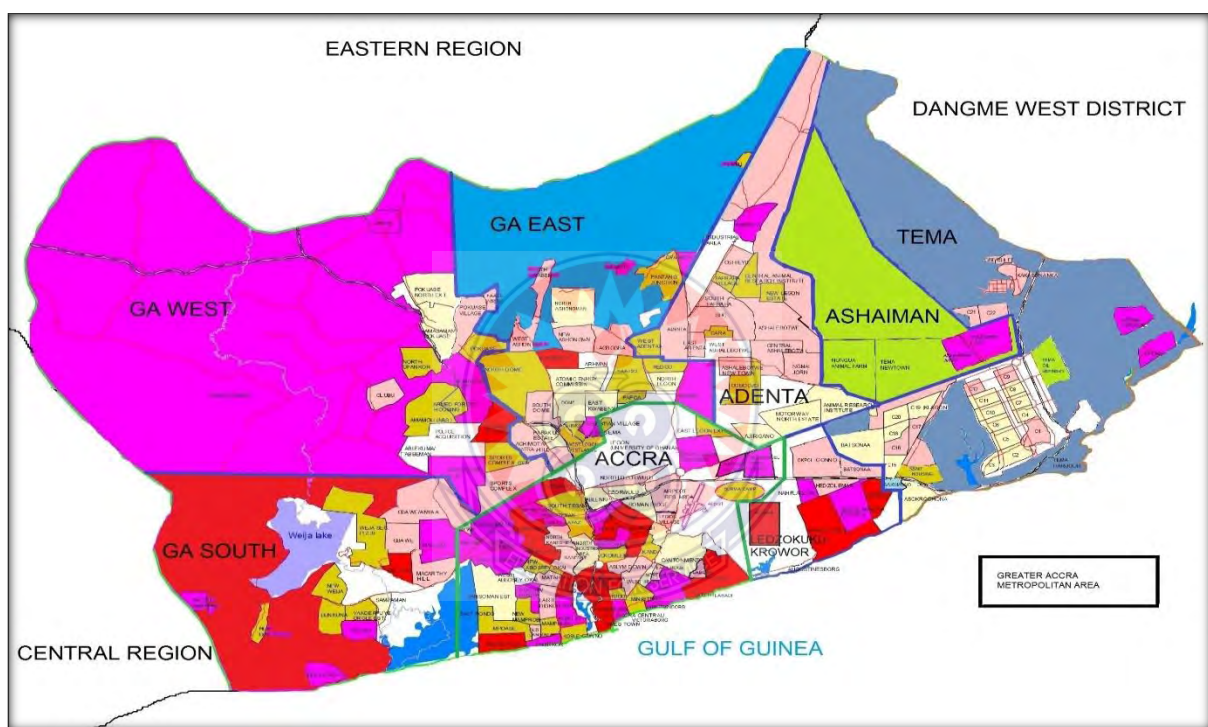
Figure 3.1: District map of Accra Metropolis

3.4 Population

The target population for the study consists of all star-rated hotels in the hospitality industry located within the Accra Metropolis. In this study however, 3-star hotels and above were used as the sample since the researcher cannot effectively handle all the hotels in the municipality for this study.

3.5 Sample Size and Sampling Technique

In the sampling of the hotels for this study, the researcher used purposive sampling to select four hotels. The hotels selected were the Golden Tulip Hotel, Airport View Hotel, La Palm Royal Beach Hotel and the Movenpick Ambassador Hotel all located in the central business district of Accra. These hotels were selected for the reason being that they were situated close to each other thereby giving the researcher easy access to them. Further, the size of these hotels implies that their operations generate a significant amount of waste which needs to be effectively handled or managed to curtail bad effects.

The purposive sampling was used to sample participants from the four hotels. Management staff and operational staff who in one way or the other worked in relation to waste generation and management were the ones purposively selected. Workers such as waiters, kitchen staff, room attendants and conservancy labourers were purposively sampled for the study. Specific attention was paid to conservancy labourers because their work nature brings them into contact with waste. In all, the researcher sampled eighty (80) respondents for the study made up of 20 respondents each from the four hotels selected. The twenty respondents were made up of five (5) management staff and fifteen (15) operational staff respectively from the four hotels.

3.6   Data Collection Instruments

The researcher employed three main instruments for the collection of relevant data in the conduct of this study. These instruments include questionnaire, interview and observation. For participants who are time-constrained, questionnaires will be administered at their own convenience whilst interview will be conducted for the participants who seem to have more time on their hands and those who find it difficult to read and write such as conservancy labourers. Observation was used to acquire data to corroborate that obtained from

questionnaire and interview and also specific information which were not readily available through questionnaire and interviews.

3.7 Data Collection Procedure

The data collection procedure began with the researcher visiting the selected hotels on a familiarisation tour to familiarise herself with the environments. Later, the researcher visited the hotels formally and introduced herself as a researcher and explained her intent to the management staff. After permission was sought from the management, the researcher was then allowed to meet the selected staff and brief them of her mission. After all doubts had been cleared through questions and answers, the researcher administered the various instruments to obtain the needed data. It took about three weeks in all to get the relevant data for this study. The researcher collected the data herself without engaging the services of any research assistant.
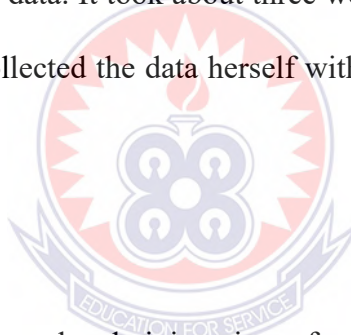
3.8 Data Analysis

Data obtained for the study through administration of research instruments were edited, coded and categorized before analysis and interpretation of the result was done in relation to research questions in order to ensure content validity of the data. Descriptive statistics such as simple frequencies, percentages, means and standard deviations were applied to analyse the data. The data obtained was analysed with the help of computer software SPSS version 20. Data obtained from the respondents through interviews were analysed using qualitative techniques.

3.9 Validity and Reliability

Validity and reliability in research is the degree of stability exhibited when measurement is repeated under identical conditions (Burns & Grove, 1997). Research validity refers to the

49

researcher's objectivity in actually measuring what was supposed to be measured and not something else. The researcher in an attempt to come up with a very good work presented a draft of the questionnaires to her course mates to critique the questions. The comments and suggestions were taken in good faith and subsequently made the necessary modifications. The questionnaire was based on the research objectives and information obtained from literature review. This was to ensure that it was from a representation of elements from the topic under discussion (Polit & Hunger, 1993). Finally, the questionnaire was presented to the researcher's supervisor to look through and advise the researcher appropriately. All these processes ensured that the questionnaires were both reliable and valid.

3.10 Ethical Considerations

The study paid attention to the ethics of research. Before the study took off, the researcher wrote officially to the department to seek for permission and cover letter to start the study. The researcher also ensured that the information provided was used only for the purposes of the study. Again, in line with ethical principles in research, respondents' rights to self-determination, anonymity, confidentiality and informed consent were observed. The respondents were informed of their rights to voluntarily participate or decline in the study. They were informed about the purpose of the study and were assured of not reporting any aspect of the information they provided in a way that will identify them. They were assured that there were no potential risks involved in the process. Finally, plagiarism has become a thorn in the flesh of researchers these days. To this end, the researcher made references to works that are not the original work of the researcher. Such works were acknowledged for easy reference and also to make the study more credible.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The researcher conducted this study in the Accra Metropolis of the Greater Accra Region of Ghana to investigate the solid waste management process in the hotel industry. This chapter of the study presents the results obtained from the data collection process. The chapter deals with the presentation and analysis of data using descriptive statistics such as frequencies, percentages and means. The analysis of data was guided by the objectives of the research set at the beginning of the study.

The chapter is made up of four parts. The first part contains the presentation and discussion of demographic characteristics of the respondents. The second deals with the solid waste management practices in the hospitality industry whilst the third part presents analysis and discussion on the challenges hospitality establishments encounter in the management of their solid waste. The final and fourth part talks about the perceived effects of poor solid waste management on the hospitality industry and the general environment as a whole.

4.2 Demographic Profile of Respondents

As a means of understanding the demographic dynamics of the respondents selected for the study, the researcher collected such information as gender, age, educational level, section of work and number of years working in the hotel. This was done to further establish the suitability of the participants for the study and provide a basis for further discussion and inferences. The demographic data collected is presented in Table 4.1 after which a discussion is presented.

Table 4.1: Demography of respondents

Variables	Frequency (f)	Percentage (%)
Gender		
Male	23	29.7%
Female	57	71.3%
Total	80	100%
Age		
Below 20 years	11	13.8%
20 – 25 years	21	26.3%
26 – 30 years	27	33.8%
31 – 39 years	14	17.5%
40 – 49 years	7	8.8%
50 – 59 years	-	-
60 years and above	-	-
Total	80	100%
Educational Level		
Basic school	6	7.5%
Senior high school	27	33.8%
Post-Sec/Polytechnic	17	21.3%
1st Degree	24	30%
Post Graduate	6	7.5%
Total	80	100%
Department/Section of Work		
Housekeeping	24	30%
Front Office	9	11.3%
Kitchen	26	32.5%
Restaurant/Bar	21	26.2%
Total	80	100%
Number of years worked in Hotel		
Less than a year	17	21.3%
1 – 3 years	45	56.3%
4 – 9 years	12	15%
10 – 15 years	3	3.7%
16 years and above	3	3.7%
Total	70	100.0

Source: Field survey, 2017

Table 4.1 depicts the demographic profile of the respondents presented under different categorical groupings. From the data shown in the table, it is seen that the greater majority of respondents were females recording a frequency representation of 57 out of the total 80. This in percentage terms was 71.3% whilst the remaining 29.7% with a frequency representation

of 23 out of 80 were males. This goes to support the common view that the hospitality industry is dominated by females. This according to Wisnu (1998) is due to the fact that women are generally regarded as being hospitable and warm at heart. The 29.7% males recorded in the table is attributed to the fact that these males were managers and/or holding senior positions.

The age information on respondents as presented in the table reveals that the majority of respondents (33.8%) were aged between 26 – 30 years. From the table, 11(13.8%) of respondents were below 20years whilst 21(26.3%) were aged 20 – 25years. Also, 17.5% were in the age group of 31 – 49 years with the remaining 8.8% in the range of 40 – 49 years. The data shows that no respondent was recorded to be 50 years and above. It therefore goes without saying that staff of the hospitality industry are mostly energetic youth who fall below 40 years. A look at the educational level of respondents presented in the table shows that the majority of homemakers are senior high school leavers. This is because 33.8% representing a frequency of 27 out of 80 had senior high school as their highest educational level with first degree being the next most held educational qualification recording 24(30%) of respondents. From the data, 6(7.5%) respondents said they were basic school leavers. It is also seen that 17(21.3%) had post-secondary school or polytechnic education. The remaining 6(7.5%) had post graduate qualification as their highest education. This indicates that the workers of hospitality institutions are adequately educated since only 7.5% were holders of basic school education and below.

The section or department of work of respondents reveals that 24 respondents representing 30% worked in the housekeeping section. In the same vein, 9(11.3%) respondents worked at the front office department whilst 26(32%) being the majority worked at the kitchen. It is

53

further seen that the remaining 21(26.2%) respondents worked at the restaurant or bar department of their respective hotels.

The last item in Table 4.1 sought to know the number of years that respondents have been working in their respective hotels. To this, 17(21.3%) of respondents said they had worked less than a year in their hotels whilst majority 45(56.3%) said they had worked for between 1 – 3 years. Similarly, 12(15%) intimated that they had worked for 4 – 9 years in the hotels whilst three (3) respondents each representing 3.7% said they had worked for 10-15 years and more than 16years respectively. This is a clear indication that most hospitality workers had not been there for long. This is explained by Tang (2004) that due to the volatile nature of hospitality jobs, most staff do not stay for long but rather use the industry as a stepping stone. This accounts for the high employee turnover rates in the hospitality industry.

4.3 Waste Management Practices in the Hotel Industry

Waste management is a big issue of concern for researchers especially in the hospitality sector since the industry generates a good amount of waste which needs to be managed efficiently. According to Bohdanowicz, (2005), waste generation is considered to be the most noticeable effect which the hospitality sector has on the environment due to the fact that many of the establishments in the sector use large quantities of consumer goods as part of their operations. In this regard, the researcher sought to find out from respondents how waste generation, collection and disposal is handled in the hospitality industry. Tables 4.2, 4.3 and 4.4 present the data collected on waste management practices in the hospitality sector.

Table 4.2: Kind of solid waste that is mostly produced in hotels

Waste type	High (20kg/day)		Medium (10kg/day)		Low (5kg/day)	
	f	*%*	*f*	*%*	*f*	*%*
Food waste (guest leftovers, raw vegetables, meat, etc)	64	80%	10	12.5%	6	7.5%
Paper waste (packaging, newspapers, magazines, etc)	6	7.5%	48	60%	26	32.5%
Plastic waste (pet bottles, plates and bowls, etc)	12	15%	38	47.5%	30	37.5%
Textile waste (pillows, laundry, table cloths, napkins, etc)	6	7.5%	24	30%	50	62.5%
Glass/ceramic waste (bottles, plates, etc)	-	-	-	-	80	100%
Aluminium waste (cans, steel plates, spoons, etc)	-	-	16	20%	64	80%

Source: field survey, 2017.

Table 4.2 sought to find out the type of solid waste that is mostly generated or churned out by the hospitality industry. The data presented in the table shows that 80% of respondents rated food waste as being produced on the high note whilst only 12.5% and 7.55 respectively said food waste was produced on medium and low scales. With respect to paper waste, 7.5% said it was high, with 60% saying its generation was medium whilst 32.5% said it was low. The next item, plastic waste was rated high by 15% of respondents while 47.5% said it was medium produce. However, 37.5% said the production of plastic waste was low in their hotels. Textile waste was rated as low by 62.5% of respondents with the remaining 30% and 7.5% going for medium and high production of textile wastes respectively. Glass recorded the lowest amount of production as all 80 (100%) of respondents said that glass waste was produced on a low note in their hotel. In a similar sense, aluminium recorded 80% responses who said its generation was low with the remaining 20% saying it was medium. This indicates that the solid waste produced in hotels is largely made up of food wastes. Plastic waste, paper waste, textile waste, glass/ceramic waste and aluminium waste follows in that order as seen from the table. This is supported by research as many authors confirm that food waste consists of the chunk majority of waste from the hospitality industry (Wagh, 2008; Curry, 2012; Marthinsen *et al.*, 2012). According to Curry (2012), solid waste from the

hospitality industry consists of both wet (organic/biodegradable) and dry waste. The wet waste consists primarily of food waste which can account for more than 60% of the hospitality waste.

Table 4.3: General management of solid waste in hotels

Variables	Frequency (f)	Percentage (%)
Medium of waste storage		
Closed container	34	42.5%
Open container	4	5%
Plastic bags	30	37.5%
Backyard pile	12	15%
Total	80	100%
Separation of waste before disposing		
Yes	6	7.5%
No	74	92.5%
Total	80	100%
Policy of waste reduction		
Yes	18	22.5%
No	62	77.5%
Total	80	100%
Recycling of waste		
Yes	6	7.5%
No	74	92.5%
Total	80	100%
Formal policy for generation, collection, disposal and management of waste		
Yes	38	47.5%
No	42	52.5%
Total	80	100.0
Food waste disposal method		
Burying	12	15%
Open pit dumping	-	-
Disposed by truck collectors	58	72.5%
Composting	10	12.5%
Biogas	-	-
Total	80	100%
Effectiveness of waste management practices		
Very effective	36	45%
Effective	32	42.5%
Not effective	10	12.5%
Bad	-	-
Total	80	100%

Source: Field survey, 2017

Table 4.3 collected information on the general management of solid waste in hotels. The first item presented in the table bordered on how solid waste generated in the hotel is stored before disposal is made. From the table, majority of respondents 34 (42.5%) intimated that they stored the waste in closed containers whilst 4 (5%) indicated that they used open containers. Also, 30 (37.5%) responded that they stored their solid waste meant for disposal in plastic bags whilst 12 (15%) indicated that they used a backyard pile for the non-degradable aspect of their solid waste. McCoy, Bacot and Galvan (2002) opine that the hotel industry is a main source of waste generation which is mostly directly sent to the landfill sites without any proper treatment.

A further look at the table shows that on the issue of waste separation before disposal, only 7.5% of respondents responded affirmatively whilst the remaining 92.5% responded in the negative. This indicates that the majority of waste produced in the hospitality industry is just bulked together for disposal at refuse dumps and landfill sites. This goes to support what McCoy *et al*., (2002) stated being that the waste is not given any proper treatment but just sent to landfill sites.

Again, from the table, respondents were asked whether their hotels had a policy of waste reduction. To this statement, only 18 respondents out of the total of 80 representing 22.5% responded in the affirmative with the remaining 62 out of 80 which represents 77.5% responding negatively. This shows that, most of the hotels do not have any policy or guidelines for waste reduction and as such conscious efforts are not put in place to reduce the total amount of waste generated by the hotel daily. This accounts for the reason why the hotel industry generates such high quantities of waste. According to Tribe *et al.*, (2000) most hotel operators do not demonstrate commitment to environmental management practices such as waste minimisation and recycling.

On the issue of waste recycling in the hotel sector, only a small percentage of 7.5% indicated that they practiced waste recycling of some sort whilst the remaining 92.5% did not practice any waste recycling at all.

Regarding formal policy for generation, collection, disposal and management of waste, 47.5% of respondents agreed that they had such policy in place whilst 52.5% said they did not. In this instance, it can be inferred that the policy for waste management was only with regards to generation, collection and disposal but not on waste reduction or recycling. This supports the assertion of Thomas-Hope, (1998) that mostly, the approach to waste management in the hospitality sector was ad hoc, with formal policies in some cases on collection and disposal.

The researcher sought to know how the hotel sector deals specifically with the food waste it generates, which account for majority of its total waste. Data from the table shows that, 15% buried their food waste, 72.5% disposed it through truck collectors and 12.5% used it for composting whilst none used open pit dumping and biogas.

Last but not the least, respondents were asked to rate the effectiveness of the waste management practices of their hotels. To this effect, 45% said that their waste management was very effective whilst 42.5% indicated that it was effective. Only 12.5% said their waste management processes was not effective. In general, it can be seen that from staff and management's perspectives, their waste management practices were effective in the sense that it got rid of the waste from their premises without problems.

Table 4.4 sought to find out the method of waste management employed by the hotels in the study. Respondents were presented with a list of waste management options and were allowed to select all those that were applicable or being practiced in their hotels. In this case,

one person could select more than one option. For instance if a particular hotel was practicing waste recycling and disposal, a respondent was free to select the two as their response.

Table 4.4: Method of waste management employed by hotels

Method of waste management	Responses		Percent of Cases
	N	Percent	
Waste recycling	24	14.1%	30.0%
Waste reduction	54	31.8%	67.5%
Waste disposal	80	47.1%	100.0%
Waste recovery	12	7.1%	15.0%
Total	170	100.0%	212.5%

Source: Field survey, 2017

The data presented in Table 4.4 shows that the most favoured or practiced waste management method was waste disposal. This is because from the percentage of cases in the table, all 80 respondents representing 100% selected waste disposal as a management method. According to Pirani and Arafat (2014), 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, hence the most obvious method is disposal.

Also, the next waste management method practiced by hotels as indicated in the table was waste reduction. This is because 54 out of 80 selected this option which represented 67.5%. It was seen in the previous table that most hotels did not have policy for waste minimisation or reduction. This does not indicate that they did not practice waste reduction as is seen in this result. It however only points to the fact that there was no formal policy for waste reduction but informally, waste reduction was practiced.

The least practiced waste management methods as seen from the table were waste recovery and waste recycling with case wise percentages of 15% and 30% respectively. This indicates

that the most preferred waste management method by hotels was disposal as this was relatively cheaper compared to the other methods. Hotel solid waste literature is replete with results that confirm this finding. Singleton (2012), Margerum (1999), Fernandez (1997) and Wilson *et al*. (2001) all opined that there is the natural tendency for hotel owners and managers to opt for the cheapest source of waste management which obviously is disposal at landfill sites. This is because it takes a lot of resources, careful planning and time to implement other beneficial and innovative waste management methods like recycling, recovery, composting, biogas, etc.

4.4 Challenges of Solid Waste Management in the Hotel Industry

Throughout history, human advancement has been intrinsically linked to the management of solid waste due to its effect on both public and environmental health. Solid waste management has a long and convoluted history (Nathanson, 2015). With industrial progress, growing urban areas and rapid population growth, solid-waste management has become a major concern in many developing countries. Solid waste management has become a challenging activity for all stakeholders particularly for businesses that has a high waste generation rate such as hospitality businesses. The researcher in a bid to find out the challenges hotel operators face in the management of solid waste distributed questionnaire aimed at soliciting such information. This is presented in Table 4.5.

Table 4.5: Challenges associated with waste management in the hotel industry

Variables	SD		D		N		A		SA		Mean
	f	%	f	%	f	%	f	%	f	%	($\bar{x}$)
Low economic value of recycling waste	6	7.5%	16	20%	-	-	14	17.5%	44	55%	3.93
High cost of waste management and recycling equipment	-	-	12	15%	6	7.5%	36	45%	26	32.5%	3.95
High composition of non-degradable waste	-	-	-	-	12	15%	36	45%	32	40%	4.25
Lack of technical know-how to implement effective waste management	-	-	6	7.5%	16	20%	26	32.5%	32	40%	4.05
Expensive nature of good waste management systems	-	-	-	-	10	12.5%	46	57.5%	24	30%	4.18
Lack of government support in waste management	6	7.5%	16	20%	4	5%	28	35%	26	32.5%	3.65
Waste management is labour intensive	-	-	-	-	-	-	56	70%	24	30%	4.30
Higher waste production levels by guests	6	7.5%	6	7.5%	12	15%	16	20%	40	50%	3.97

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
Source: Field survey, 2017.

As has been seen in literature, effective waste management is a challenging activity even for organisations that deal with small amounts of wastes. There are several factors that constitute challenges for hotel managers and operators on the issue of waste management. Table 4.5 presents some of these challenges.

The data in Table 4.5 is presented on a 5-point Likert scale response as Strongly Disagree (SD) = 1, Disagree (D) = 2, Not Sure (N) = 3, Not sure, Agree (A) = 4 and Strongly Agree (SA) = 5. For analysis purposes, brevity and conciseness the researcher condensed the 'strongly disagree' and 'disagree' categories to mean Disagree; and 'strongly agree' + 'agree' to mean Agree. Based on the five-point Likert scale used, a computed mid-point mean value of 3.0 was used (Cohen, Manion & Morrison, 2007). The mean values range from 1.0 to 5.0. Any variable whose responses record a mean value less than 3.0 ($\bar{x} < 3.0$) is considered rejected or disagreed to whilst a mean value above 3.0 ($\bar{x} > 3.0$) signifies general agreement or acceptance of the statement with a mean value of 3.0 indicating neutrality.

A cursory look at the table reveals that the mean values for all the variables presented range from 3.65 to 4.30. An indication that, all the variables presented were accepted as challenges

encountered in the management of waste in the hotel sector. However, a detailed look at the table shows that, some of the challenges were considered to be more intense than others.

The data shows that, a combined percentage of 72.5% agreed that low economic value of recycling waste was a challenge to waste management whilst 27.5% disagreed. This item scored a mean of 3.93 indicating that respondents accepted it as a challenge to waste management.

In the same vein, high cost of waste management and recycling equipment was accepted as a challenge to waste management in the hotel industry recording a mean of 3.95. The agreement percentage was 77.5% as against 27% of disagreement with 7.5% being neutral.

High composition of non-degradable waste in the hotel waste was also agreed on as being a challenge to waste management in the sector. The variable received the highest mean value of 4.25 meaning it was accepted by majority of respondents. It is seen that 85% of respondents agreed to this item whilst the remaining 15% remained neutral.

Regarding the issue of technical know-how to implement effective waste management, 72.5% agreed that it was a challenge to hotel solid waste management whilst 7.5% disagreed with the remaining 20% opting for neutrality.

The issue of expensive nature of good waste management systems was accepted strongly with a high mean value of 4.18. Respective agreement and disagreement values indicate that 87.5% agreed whilst 12.5% were neutral. Lack of government support in waste management, waste management being a labour intensive process and higher waste production level by guests were agreed in strong terms with respective mean values of 3.65, 4.30 and 3.97.

It is seen from the foregoing that expensive nature of proper waste management and cost inputs featured prominently in the challenges facing hotel managers in their waste management. It therefore suggests that, the main challenge of waste management according to hotel management and staff was its cost aspect. Cummings and Cummings (1990) support the assertion that even in countries where supportive frameworks for better waste management systems exist, implementing these strategies may not be judged to be in the best interest of the establishments. These may be from a financial standpoint, marketing or social perspective. Memon (2010) also opines that hotel establishments shun away from integrated solid waste management systems which focus on recycling, reuse and recovery due to its inherently expensive nature.

Also functional equipment and logistics, governmental support and technical know-how were cited among others as being significant challenges of waste management in the hospitality industry. Omidiani and HashemiHezaveh (2016) posits that presently there are improper waste management practices in hotel industry due to lack of suitable facilities (equipment, infrastructure and logistics) and underestimates of waste generation rates, inadequate management and technical skills and less government support especially in developing nations. This is further supported by Jindal *et al.,* (1998) who said that local conditions affect the attractiveness of recycling for most entrepreneurs and business owners. They explained that the costs associated with recycling waste materials can be higher than those for virgin materials.

4.5 Effects of Poor Solid Waste Management on hospitality industry and the General Environment

Waste has several significant adverse effects on the environment, firms and organisations and the nation especially when it is given the needed attention. In this current study, the researcher sought from respondents their perceived effects of poor waste management in the hospitality sector both on the environment and on the hotels. The result is presented in Table 4.6

Table 4.6: Effects of poor solid waste management on hotels and the general environment

Variables	SD		D		N		A		SA		Mean
	f	%	f	%	f	%	f	%	f	%	($\bar{x}$)
Open dumping leads to breeding of insects and pests	-	-	-	-	-	-	46	57.5%	34	42.5%	4.42
Decline in customer patronage and profits	8	10%	6	7.5%	18	22.5%	24	30%	24	30%	3.62
Health problems and complications for staff and guests	12	15%	34	42.5%	16	20%	12	15%	6	7.5%	2.57
Improper waste management gives offensive odours	-	-	12	15%	6	7.5%	46	57.5%	16	20%	3.83
Outbreaks such as cholera and diarrhea	12	15%	18	22.5%	12	15%	22	27.5%	16	20%	3.15
Choking of drains and gutters by solid waste can cause flooding	-	-	6	7.5%	6	7.5%	42	52.5%	26	32.5%	4.10
Unsightly garbage scenes may lead to loss of appetite among customers	28	35%	26	32.5%	6	7.5%	14	17.5%	6	7.5%	2.30
Contamination of food through improper waste management	-	-	-	-	-	-	46	57.5%	34	42.5%	4.42
Customers spread negative word of mouth to others if they observe improper management of waste	-	-	-	-	-	-	12	15%	68	85%	4.85
Emission of greenhouse and landfill gases pollute the air	-	-	16	20%	16	20%	28	35%	20	25%	3.65

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.
Source: Field survey, 2017.

Table 4.6 presents the perceived effects of solid waste management on hotels that generate it and the general environment as a whole. The data presented in this table is in the form of

64

Likert scale responses with mean values indicating strength of agreement/acceptance or disagreement/rejection of the various effects.

From the table, open dumping leading to breeding of insects and pests which are vectors for disease causing organisms was strongly accepted as an effect of poor solid waste management. With a mean of 4.42, all 80 respondents agreed representing 100%. The individual values reveal that 42.5% strongly agreed whilst 57.5% agreed. This is an indication that all the hotel firms in this study see the negative effects of open dumping and do their best to avoid that practice of waste management. A view concurred by Pinnock (1998) saying that disease vectors such as mosquitoes, flies, cockroaches and rodents thrive on solid waste.

Also, respondents agreed that improper waste management lead to decline in customer patronage and profits of the hotels. This is because 60% agreed to this statement whilst only 17.5% disagreed with the remaining 22.5% being neutral. In addition, this item received a mean score of 3.62 which is significantly above the accepted mean value of 3.0.

It is seen from the table that health problems and complications for staff and guests was disregarded as being an effect of poor solid waste management in hotel firms. To this item, only 22.5% agreed whilst 57.5% disagreed and the remaining 20% opted for neutrality. This result is rather at variance with Jindal *et al.,* (1998) assertion that people working in the waste management sector can encounter a number of work related health concerns such as pain, illness, stress, injuries, accidents and emergencies. Further, Lohani and Baldisimo (1991) opined that waste pickers at dump sites report numerous negative health effects such as eye irritations, respiratory diseases, asthma, leg cramps, backache, minor accidents and mental health problems.

Regarding the production of offensive odour from improper waste management, 77.5% of respondents agreed whilst 15% did not. Only 7.5% stayed neutral. The statement received a mean value of 3.83 suggesting the acceptance of respondents of this effect. This is supported by Haan, Coad and Lardinois, (1998) who assert that waste is unsightly and malodorous, polluting land, air and water, drainage systems and posing serious public health risks.

Respondents weakly accepted that improper waste management in hotels could lead to outbreaks such as cholera and diarrhea. This is because 47.5% agreed as against 37.5% who disagreed with 15% staying neutral. Also the recorded mean value of 3.15 suggests a weak acceptance of this effect.

Respondents agreed that choking of drains and gutters by solid waste can cause flooding with a mean of 4.10 and agreement percentage of 85%. On the other hand, respondents rejected the assertion that unsightly garbage scene may lead to loss of appetite among guests and customers. This statement received a mean rating of 2.30 which is below the acceptable mean value and further, 67.5% respondents disagreed with only 25% agreeing.

Effects like cross contamination of food through improper waste management, customers spreading negative word of mouth due to improper waste management and emission of greenhouse and landfill gases to pollute the air all received significant agreement from respondents. The respective mean scores for the three effects are 4.42, 4.85 and 3.65. These mean values suggest that the effect which was accepted in strongest terms is that customers spread negative word of mouth to tarnish reputation of hotel firm when they observe improper management of waste.

The foregoing discussion shows that apart from health problems and complications for staff and guests and unsightly garbage scenes causing loss of appetite among customers which were rejected, all the other effects were accepted by respondents. A critical look at the data shows that among the effects, the one that was rated high or strongly accepted was the spreading of negative word of mouth by customers, followed by breeding of insects and pests. Also, cross contamination of food, flooding due to choked drains followed in that suit. Several researchers (Listyawan, 1997; Wisnu, 1999) assert that an estimated 60% of solid waste is not collected or disposed of properly and is instead dumped in informal landfills, rivers, along roadsides, etc. This has resultant adverse effects.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter of the study presents the summary of key findings, the conclusion and recommendations.

5.2 Summary of Key Findings

From the analysis of the data collected through questionnaire administration, several findings were arrived at. These findings are presented in a summarized manner in accordance with the research objectives.

- From the analysis, it was found that food waste constitutes the greater majority of waste; produced in high quantities of 20kg per day in the hotel industry followed by plastic. Several other waste categories are generated in the sector but on a minimal level. The solid waste was mostly stored in closed containers and in plastic bags to be collected and disposed of by truck collectors.

- It was further seen that, the hotels do not practice separation, reduction and recycling of waste. The hotels also had no formal policy for waste reduction, recycling and overall waste management. The dominant waste management practice was disposal practiced by all hotels, after which waste reduction was attempted.

- The study revealed that waste management is not without its attendant challenges and problems. In this study, it was found that the major challenges of solid waste management were the labour intensiveness, high composition of non-degradable waste, high cost lack of technology and equipment to implement effective solid waste management systems. Also, challenges like lack of governmental support and low economic value of recycling waste were also cited.

68

- According to the results, respondents accepted that waste leads to breeding of insects and pests, the spread of negative word of mouth to affect hotel reputation also accepted by the respondents, flooding due to choked gutters, and offensive odours emanating from improper waste management was listed as some of the effects of poor solid waste management on the hotel sector and the environment as well.

5.3 Conclusion

Waste management is a complex task which makes it particularly challenging for stakeholders to deal with. Waste production from hotel industries is one of the major issues in Ghana because waste is not treated well. Therefore, this study sought to investigate the waste management practices in the hotel sector in the Accra Metropolis.

The study shows that waste management in the hotel sector in the study area is mostly done through disposal or dumping at landfill sites. It was however realised that various challenges plague the waste management process such as high financial costs, little or no technology, lack of government support and labour intensiveness. The negative effects of improper waste management that affect the hotel sector and the general public were also seen as negative word of mouth for hotel, breeding of insects and pests that carry disease causing organisms, flooding and offensive odours.

5.4 Recommendations

Based on the outcomes and results of this study, the researcher wishes to make the following recommendations for stakeholders in the hotel industry:

- The government should enact legislation and policy that makes it mandatory for hotel managers and owners to recycle part of their waste.

- Conscious efforts should be made at educating all stakeholders on the benefits of implement the 3Rs of waste management; thus Reduction, Reuse and Recycling.

- Waste recycling plants should be built with the necessary infrastructure to boost the rate of recycling waste in the nation by the government.

5.5 Suggestions for Further Research

The concept of hotel waste management is a multi-faceted and complex environmental issue, many aspects of which lay beyond the bounds of this masters' thesis. In this regard, the researcher wishes to make recommendations or suggestions for further research which future researchers can consider.

1. A study could be conducted to identify the best method for setting commercial food waste reduction targets.

2. Studies could also be conducted to examine in detail the impact of private waste infrastructure ownership upon the development of waste management systems in the country.

3. Future researchers can also study the impact of improper waste management on the performance and profitability of hotel firms in the country.
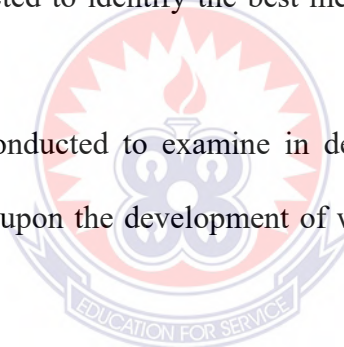
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71

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83

APPENDIX

QUESTIONNAIRE FOR HOTEL STAFF

INTRODUCTION

I am a final year M.Tech. Catering and Hospitality student in the University of Education Winneba, Kumasi Campus. I am conducting a study into effective solid waste management in the hotel industry in Ghana. This questionnaire is designed to gain an understanding into the solid waste management practices of your organisation. Your responses to the items are necessary for the success of the study. Any information provided is solely for academic purposes and absolute confidentiality is assured. Please tick [√] in the spaces provided. Thank you for your co-operation.

SECTION A: SOCIO DEMOGRAPHIC DATA

1. Gender
   a) Male   [   ]
   b) Female   [   ]

2. Age (in years)
   a) Below 20 [   ]
   b) 20 – 25   [   ]
   c) 26 – 30   [   ]
   d) 31 – 39   [   ]
   e) 40 – 49   [   ]
   f) 50 – 59   [   ]

3. Educational qualification:
   a) No formal education   [   ]
   b) Basic education   [   ]
   c) Senior High School   [   ]
   d) Post-Sec/Polytechnic [   ]
   e) Bachelor's Degree   [   ]
   f) Post-Graduate Degree [   ]

4. Section/Department of work

   a) Housekeeping   [   ]

   b) Front Office   [   ]

   c) Kitchen   [   ]

   d) Restaurant/bar   [   ]

5. What position do you hold in this hotel?

………………………………………………..

6. How long have you worked in this hotel?

   a) Less than a year   [   ]

   b) 1 – 3 years   [   ]

   c) 4 – 9 years   [   ]

   d) 10 – 15 years   [   ]

   e) 16 years and above [   ]

SECTION B: HOTEL SOLID WASTE MANAGEMENT PRACTICES

7. What kind of solid waste is produced most in your hotel?

S/N	Waste Type	Quantity produced		
		High 20Kg	Medium 10Kg	Low 5Kg
A	Food waste (guest leftovers, raw vegetables, meat, etc)			
B	Paper waste (packaging, newspapers, magazines, etc)			
C	Plastic waste (pet bottles, plates and bowls, etc)			
D	Textile waste (pillows, laundry, table cloths, napkins, etc)			
E	Glass/ceramic waste (bottles, plates, etc)			
F	Aluminium waste (cans, steel plates, spoons, etc)			

8. In what medium does the hotel store its solid waste to be disposed?

   a) Closed container [   ]

   b) Open container   [   ]

   c) Plastic bags   [   ]

   d) Backyard pile   [   ]

85

9. Does the hotel separate/sort its wastes before disposing?

Yes [ ]   No [ ]

If Yes, why?...

If No, why?..

10. Is there a policy for the reduction of waste to a minimum?

Yes [ ]   No [ ]

11. Does the hotel recycle any of the wastes that it generates?

Yes [ ]   No [ ]

12. If 'Yes', state the type of waste that is recycled:

………………………………………………………………………………….

13. Has your hotel instituted any formal policy for the generation, collection, disposal and management of waste?

Yes   [ ]   No   [ ]

14. If yes above, briefly state the policy: ……………………………………………….
………………………………………………………………………………….

15. How does the hotel get rid of food/organic waste?

a) Burying   [ ]

b) Open pit dumping   [ ]

c) Disposed by truck collectors [ ]

d) Composting   [ ]

e) Used for biogas   [ ]

16. How effective are the waste management practices of your organization?

a) Very effective   [ ]

b) Effective   [ ]

c) Not effective   [ ]

d) Bad   [ ]

17. Which of these methods of solid waste management are applicable to your organization? Select as many as apply.

    a) Waste recycling   [   ]

    b) Waste reduction   [   ]

    c) Waste disposal   [   ]

    d) Waste recovery   [   ]

Other(s). Please specify:……………………………………………………

SECTION C: CHALLENGES OF SOLID WASTE MANAGEMENT IN THE HOTEL INDUSTRY

Please tick (✓) in the appropriate box to indicate the extent to which you agree or disagree to the following statements regarding challenges of waste management in the hotel industry.

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.

No.	Statement	SD	D	N	A	SA
18	Low economic value of recycling waste					
19	High cost of recycling equipment					
20	High composition of non-degradable waste					
21	Lack of technical know-how to implement effective waste management					
22	Proper waste management is expensive					
23	Lack of government support in waste management					
24	Waste management is labour intensive					
25	Higher waste production levels by guests					

SECTION D: EFFECTS OF POOR SOLID WASTE MANAGEMENT ON THE HOTEL AND GENERAL ENVIRONMENT

Please tick (✓) in the appropriate box to indicate the extent to which you agree or disagree to the following effects of poor solid waste management.

Key: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree.

No.	Statement	SD	D	N	A	SA
26	Open dumping leads to breeding of insects and pests					
27	Decline in customer patronage and profits					
28	Health problems and complications for staff and guests					
29	Improper waste management gives offensive odours which may lead to respiratory problems					
30	Leads to outbreaks such as cholera and diarrhoea					
31	Choking of drains and gutters due to improper disposal can cause flooding.					
32	Unsightly garbage scenes may lead to loss of appetite among customers					
33	Cross contamination of food through improper waste management					
34	Customers spread negative word of mouth to others if they observe improper management of waste					
35	Emission of greenhouse and landfill gases pollute the air					