

UNIVERSITY OF CAPE COAST



**SOLID WASTE MANAGEMENT IN HOTELS IN THE
KUMASI METROPOLIS**

BY

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DISSERTATION SUBMITTED TO THE INSTITUTE FOR DEVELOPMENT
STUDIES OF THE FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF
CAPE COAST, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR AWARD OF MASTER OF ARTS DEGREE IN ENVIRONMENTAL
MANAGEMENT AND POLICY

DECEMBER, 2014

DECLARATION

Candidate's Declaration

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

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Signature:..... Date:.....

Supervisor's Declaration

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

Supervisor's Name: Dr. Oheneba Akyeampong

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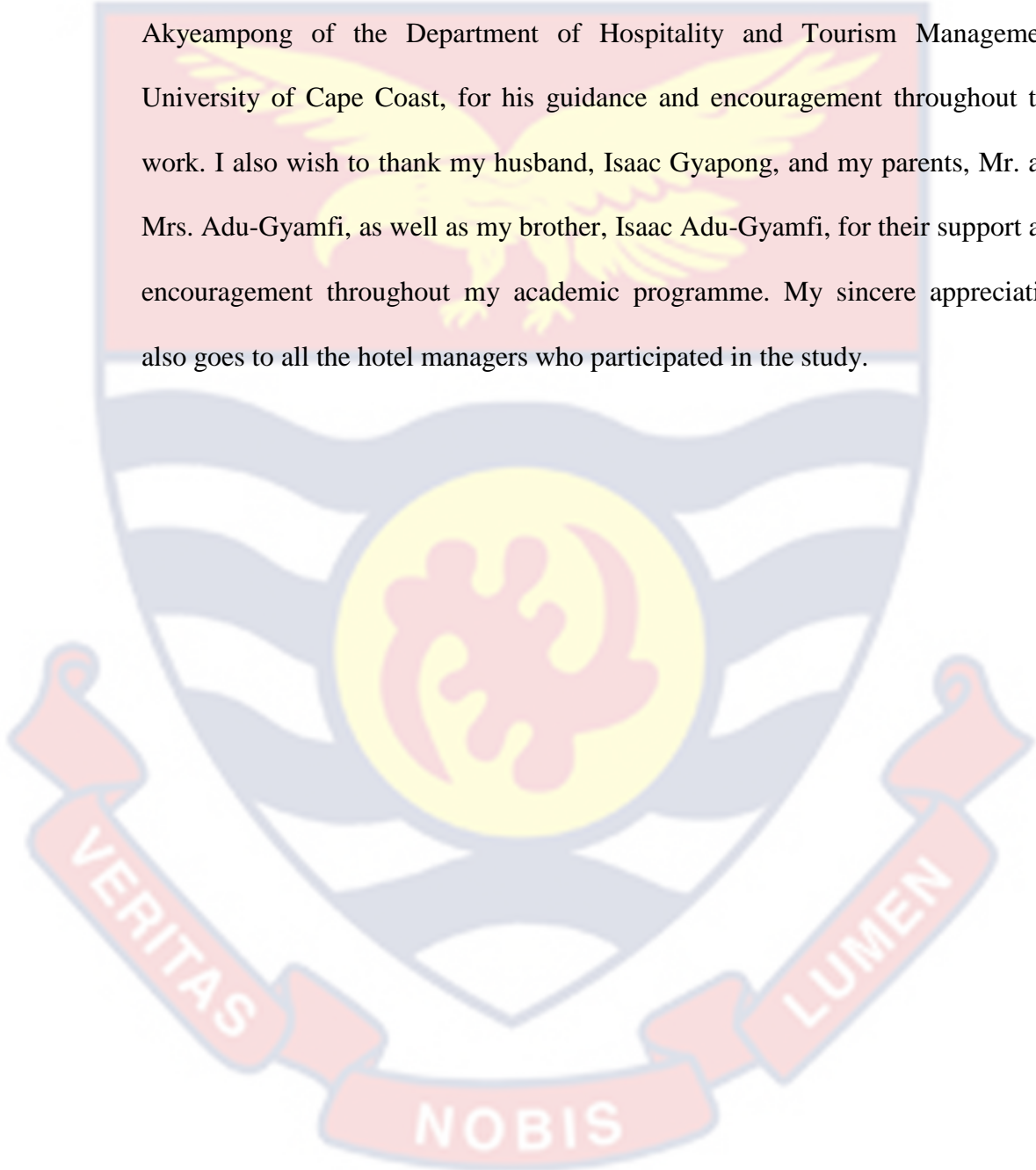
ABSTRACT

The study set out to examine the techniques of solid waste management adopted by hotels in the Kumasi Metropolis as hotels are seen to be major contributors to waste generation within the tourism industry. Specifically, it involved an examination of the types of solid waste generated, the strategies used to manage solid waste in the hotels and identifying the associated challenges that the hotels face in managing solid waste. A cross-sectional design was adopted to survey 54 hotels managers in the metropolis. Questionnaires were used to collect data from the managers and the data were analysed using descriptive statistics, such as means, medians, frequencies, and percentages. Kruskal Wallis H and chi-square tests with their associated p-values were used to test for the statistical significance of the association between the study variables.

The study found that the solid waste generated in hotels within Kumasi Metropolis included plastics, organic waste, paper and metallic wastes. However, plastics formed the highest percentage, in terms of the volumes produced. Moreover, the main solid waste management strategy adopted by the hotels was waste prevention while the major challenges facing the hotels in the management of solid waste were the high cost of managing solid waste and insufficient staffing needs for waste management. The study recommends that managers should establish a working environmental policy for their hotels. In addition, the managers are urged to engage in recycling and awareness creation to shareholders for the release of funds for managing solid waste in the hotels.

ACKNOWLEDGEMENTS

I wish to express my gratitude to my supervisor, Dr. Oheneba Akyeampong of the Department of Hospitality and Tourism Management, University of Cape Coast, for his guidance and encouragement throughout this work. I also wish to thank my husband, Isaac Gyapong, and my parents, Mr. and Mrs. Adu-Gyamfi, as well as my brother, Isaac Adu-Gyamfi, for their support and encouragement throughout my academic programme. My sincere appreciation also goes to all the hotel managers who participated in the study.



DEDICATION

To my daughters, Sasha Gyapong and Kim Gyapong



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INTRODUCTION

CHAPTER ONE

Background to the study

Travel and tourism make up one of the world's largest industries. Reports from the United Nations World Tourism Organisation (UNWTO, 2008) indicate that travel and tourism represent approximately 7 percent of total world goods and services; tourism is the most important export after fuel, chemicals and automotive products. Travel and tourism is a major economic force, generating an estimated US\$3.5 trillion in gross output in 2001 (WTTC et al., 2002) and is estimated to generate US \$ 919 billion in 2010, and employing an estimated 207 million people in 2001 which is expected to rise to 260 million people in 2011 (UNWTO, 2011).

The tourism industry can have both positive and negative impacts on tourist destinations (Tribe et al., 2000). Benefits include economic activity and employment opportunities. Negative impacts include deterioration of natural and cultural resources, and contribution to existing problems, such as increasing quantities of solid waste.

Accommodation plants within the tourism industry typically include hotels, motels, inns, timeshares, and spas. The importance of accommodation to tourism cannot be overemphasised. WTTC (2000) indicates that accommodation alone accounts for 31 percent of global tourists' expenditure. However

accommodation facilities have been noted for generating large volumes of solid and hazardous waste (P.A Consulting Group, 2001).

According to the International Hotel Environment Initiative (IHEI 2002) a hotel guest can produce an average of one kilogram of waste daily. This accumulates to thousands of tonnes of waste annually per guest. The severity of waste generation in some hotels is stressed in a report by the P.A. Consulting Group (2001). According to the report, in some regions of the Caribbean, hotels and resorts produce more solid waste than all of the local residents combined. Hotels often generate large quantities of solid waste, in the form of packaging materials, kitchen and garden waste, old furniture and equipment, and potentially hazardous waste such as asbestos and solvents (WTTC et al., 2002).

Improper waste management can cause environmental degradation and loss of aesthetic appeal, through littering of beaches and streets, and illegal dumping and burning of garbage (P.A. Consulting Group, 2001). The IHEI (2000) also indicates that solid waste generation is considered one of the most adverse environmental impacts created by hotels. Collectively, they produce a vast amount of waste, much of which goes to landfill (Radwan, Jones & Minoli, 2010). In some cases, poor disposal practices on the part of hotel management have led to the garbage washing up onto the beaches and contaminating the coastal waters, threatening to destroy the very attractions that lure visitors.

Protecting the natural environment through proper waste management is therefore one of the many challenges that hotel operators face. This is because the tourism industry, which fuels the success of hotels, is largely dependent on the

environment (Mensah, 2006). Degradation of the environment may therefore connote decline in travel and patronage of hotel accommodation. On the other hand, by proactively managing these wastes, a hotel can reduce operating costs, preserve local nature attractions such as coral reefs and beaches, and reduce odours and pest infestations (Pirani & Arafat, 2014)

However, many hotel firms consider their environmental responsibilities as a secondary obligation (Bohdanowicz, 2000) and take very little action to reduce their environmental impacts (Webster, 2000). Chan and Lam (2001) add that many hotel operators have very little interest in reducing and/or recycling waste, believing that such activities are too expensive and time consuming. Todd and Hawkins (2007) further explain that waste management is sometimes ignored because there are direct and hidden costs of waste management. Direct costs typically cover the cost of disposal, while hidden costs may include expenditure related to staff, resources and energy needed for waste management.

In Pirani and Arafat (2014) analysis, waste prevention does not have to mean a reduction in the level of service offered, even for the most luxurious hotel. In many cases, waste prevention can be an “invisible” strategy, one that takes place behind the scenes of a hotel’s public operations. However, other strategies may be more visible in instances, such as using refillable shampoo dispensers instead of mini-sized bottles. Managers may, however, be concerned that their guests will perceive the change as a cut in service.

Tourism development has been pursued in Ghana since the 1960s. Since the 1980s, tourism has received a considerable attention in the economic

development strategy of Ghana. Thus, UNWTO (2011) reports that international tourist arrivals to Ghana increased from 698,000 in 2008 to 803,000 in 2009. International tourism receipts also increased from \$919 million in 2008 to \$963 million in 2009. This achievement could be attributed to the establishment of a Ministry of Tourism in 1993 to underscore government's commitment to tourism development in Ghana. Due to its central location on the world map, Ghana is well situated to take advantage of being easily accessible to tourists from West Africa, Europe and North America (GTB, 2009). Again, Ghana has a favourable reputation abroad and is known for its political and economic stability. Nevertheless, the industry is still in the early stages of development (GTB, 2009).

The hotel sector in Ghana has also experienced a rapid growth since the 1990s in response to the tourism growth and also with the implementation of the Economic Recovery Programme and the Structural Adjustment Programme (ERP/SAP) in the 1980s by the Provisional National Defence Council (PNDC) government. The number of licensed hotels rose from 350 in 1990 to 1,169 in 2002. According to the Ghana Tourism Board (GTB, 2009), this number further increased to 1,318 in 2009 and has raised several environmental concerns.

A report in the Daily Graphic of 18th February, 1998 indicated that the Golden Tulip Hotel discharged raw sewerage into a nearby drain. In addition, floods in Accra washed away part of Secaps Hotel at the Tetteh Quarshie Roundabout in 2001, because it was located on a waterway (Accra Mail, 17th October, 2001).

The Greater Accra Region, with 541 hotels, has the highest concentration of hotels in Ghana. Next to this is the Ashanti Region, with 241 registered hotels which constitute about 18 percent of registered hotels the country (GTB, 2009). Kumasi, the regional capital with a major central business district and bustling commercial activities has 164 registered hotels. Proper waste management by the hotels will therefore be critical for the protection of the environment.

Statement of the problem

The tourism industry has become an important source of income for several developed and developing economies. However, tourism can be self-destructive and can contribute to environmental degradation through waste generated from the various sectors of the industry (Noor & Kumar, 2014).

Todd and Hawkins (2007), Bohdanowicz (2000) and Webster (2000) have identified the accommodation sector, notably hotels, to be a major contributor to waste generation within the tourism industry. Proper solid waste management is therefore critical not only to hotels, but to the environment at large.

However, many hoteliers are also known to ignore their responsibility towards waste management Shen and Zheng (2010). The neglect of environmental responsibilities is known to have detrimental effects on the environment (IHEI, 2002). Shen and Zheng (2010) add that improper management of the environment leads to a reduction in tourists' arrivals. This is because tourists are becoming increasingly concerned about the environment of destinations they intend to visit (Mensah, 2006). For instance, the Conde Nast

Travellers' magazine conducted a readers' poll in September 1996, which revealed that 95 percent of travellers are concerned with the environmental conditions of their destinations (Radwan et al, 2010).

The hotel sector in Ghana experienced a rapid growth in the 1990s. However, the growth of hotels has not been without environmental consequences. There have also been increasing concerns about the environmental problems posed by hotels (GTB, 2009). Ghana's 1996 Integrated Tourism Development plan noted that sewage and solid waste disposal was a problem in some hotels. The plan recognised that there could be pollution of rivers, lakes and coastal waters from sewerage outfall lines, and of ground water by seepage of waste materials from improper development of sewerage and solid waste disposal systems in hotels and other facilities.

According to the Kumasi Metropolitan Assembly [KMA] (2006), one significant environmental challenge confronting Kumasi metropolis was waste management. The services of private waste collection agencies have contributed to some extent in controlling the problem of solid waste management within households. The services of Zoom Lion, a private waste management company, for example, have also contributed to solid waste management within the metropolis.

Nonetheless, solid waste management at large remains a major problem for the Assembly. Individuals, shop attendants, traders, food vendors, pedestrians, and motorists have been identified as major producers of solid waste. In the same vein, hotels have also been identified as major producers of solid waste, resulting

from the large number of guests they attract. Given that the Assembly has not provided adequate waste management facilities, this study seeks to assess the strategies adopted for waste management in hotels and the challenges confronting them in their waste management efforts.

Objective of study

The main objective of the study is to examine the strategies of solid waste management by hotels in the Kumasi Metropolis.

The specific objectives were to:

1. Examine the composition of solid waste generated by hotels in the metropolis;
2. Explore the strategies hotels use in managing solid waste;
3. Examine the challenges hotels face in managing solid waste;
4. Make recommendations for proper waste management in hotels in Kumasi.

Research questions

The study was guided by the following questions:

1. What is the composition of solid waste generated by hotels in the Kumasi metropolis?
2. What strategies are employed in managing solid waste in hotels in Kumasi?
3. What challenges confront hotel managers in solid waste management?

Significance of the study

A comprehensive study into waste management practices can offer businesses real opportunities on a variety of fronts. It can offer insights into the management techniques used by hotels. Possible deviations from standardised and safe waste management mechanisms can be detected and corrected through such a study. Moreover, the study will offer a deeper insight into the challenges confronting hotels in waste management and the mechanisms to address them. The study will therefore serve as a guide for hoteliers and regulatory bodies in relation to waste management practices. The study can also serve as a reference document for academia to broaden the knowledge frontiers on waste management in hotels.

Organisation of the study

Chapter One comprises background to the study, statement of the problem, objectives of the study, research questions and significance of the study. Chapter Two deals with the review of literature related to the topic under research. Areas reviewed include hotel solid waste, solid waste management technique (cost of solid waste, waste reduction, recycling, reuse and composting) as well as the conceptual framework.

Chapter Three focuses on the methods and sampling procedure for the data collection exercise. This covers the study design, study population, sources of data, sampling procedure, research instruments, fieldwork, data processing and analysis as well as problems encountered in the field. Chapter Four involves

results and discussion of data as well as the analysis. Chapter Five presents a summary of findings, the conclusions and recommendations.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

In this chapter, concepts and issues relevant to waste management in hotels are reviewed. A conceptual framework for integrated waste management, elements and strategic aspects, is used to provide an overview of solid waste management. This is preceded by a review of concepts relevant to solid waste management in hotels.

The theory of Industrial Ecology

The theory of Industrial Ecology (IE) was developed by Frosch and Gallopoulos (1989). The major concerns of the theory deal with the impacts that industrial activities have on the environment, the use of the planet's supply of natural resources, and problems of waste disposal. According to the theory, the outputs of one industry can become inputs of another, thus reducing use of raw materials, pollution, and saving on waste treatment (Pearce, 2008).

Allenby (2006) refers to the theory of industrial ecology as a systems-based, multidisciplinary discourse that seeks to understand emergent behaviour of complex, integrated human and natural systems. It approaches the concept of sustainability by examining problems from multiple perspectives, usually involving aspects of the environment, sociology, economy, and technology.

According to Pearce (2008), one of the central principles of industrial ecology is the view that societal and technological systems are bounded within the biosphere, and do not exist outside of it. Industrial ecology therefore examines societal issues and their relationship with both technical systems and the environment (Allenby, 2006; Nielsen, 2007). Through this holistic view, Pearce (2008) affirms that IE recognises that solving problems must involve understanding the connections that exist between these systems. Various aspects cannot be viewed in isolation. Often changes in one part of the overall system can propagate and cause changes in another part. Based on this framework, IE looks at environmental issues with a systems thinking approach.

A holistic environmental management practice would therefore be one in which there is the collaboration of all stakeholders (Nielsen, 2007). The social and technical connections between the various stakeholders can be seen as a system. Kim, Allenby and Xu (2007) adds that all stakeholders must understand and undertake their various roles in managing the environment in a sustainable way. A default in responsibilities by one stakeholder can potentially mar the efforts of other stakeholders. For example, Korhonen (2004a) indicates that poor environmental policy design by hotel managers can translate into severe environmental degradation, irrespective of the efforts of lower staff to uphold the principles of the policy.

Moreover, life cycle thinking is also a very important principle in industrial ecology (Tang, 2004). Van de Klundert and Anschutz (2001) imply that all environmental impacts caused by a product, system, or project during its life

cycle are taken into account. In this context life cycle includes raw material extraction, material processing, manufacture, use, maintenance, and disposal. Industrial ecology is therefore a theory of industrial operations that encourage reduction, re-use, and recycling of waste (Allenby, 2006).

The transport necessary between the stages of life cycle is also taken into account as well as, if relevant, extra stages such as reuse, remanufacture, and recycle (Korhonen, 2004a). Adopting a life cycle approach is essential to avoid shifting environmental impacts from one life cycle stage to another. This is commonly referred to as problem shifting. For instance, during the re-design of a product, one can choose to reduce its weight, thereby decreasing use of resources. However, it is possible that the lighter materials used in the new product will be more difficult to dispose of. The environmental impacts of the product gained during the extraction phase are shifted to the disposal phase. Overall environmental improvements are thus null (Korhonen, 2004b).

In the hotel industry, the theory of industrial ecology considers a hotel as an industrial entity. It suggests that the activities of the hotel have some positive and negative impacts on the natural environment. It recommends that hotels practice sound environmental management policies, waste reduction, re-use, and recycling of waste to reduce its negative effects on the environment. A sound environmental management paradigm is therefore needed to guide hotels in the pursuit of sustainability of the environment.

Ascher's Environmental Management Paradigm

The Sustainable Resource and Environmental Management Paradigm (SREMP), developed by Ascher (2000), is built upon Classis Organisation Theory which was developed by Merton in 1940. SREMP is designed to principally answer the question, what is there about organisational behaviour that gives rise to sub-optimal, unsustainable natural resource and environmental policies and practices? According to the SREMP, specific target problems answer the question.

SREMP proposes that environmental policies and practices are sometimes guided by decisions or rules that deviate from the balanced approach needed to pursue sustainable development (Ascher, 2000). The theory refers to this as 'doctrine truncation' and defines it as the simultaneous pursuit of inter-generational equity, intra-generational equity, and respect for natural systems. The theory further maintains that environmental decision rules sometimes reflect selfishness, while sometimes the technical necessities of keeping things simple may also lead to poor environmental practices in organisations (Bartone, 2000). In spite of the sources of deviation, the doctrine of sensitivity to all of the tradeoffs involved in pursuing sustainable development is often sacrificed to the truncated operational principles such as maximum sustainable yield and maximum value added (UNEP, 2008).

Graham (1971) states that the environmental hazards which result from factors similar to 'doctrine truncation' often stems from the unbalanced pursuit of organisational objectives. In cases where there are tradeoffs between securing

organisational interests and the preservation of the environment, there is the tendency for organisations to opt to satisfy business goals at the expense of the environment.

Cointreau-Levine (2000) gives evidence of cases where hotel operators have destroyed extensive areas of flora to make way for sophisticated modern buildings. To satisfy a segmented market of beach lovers, Cointreau-Levine reports that many hotels in California have clustered close to the beaches with disregard for the carrying capacity of these beaches.

The nature of solid waste generated by hotels

According to Tang (2004), it is important to know the nature of solid waste in order to know and apply proper management methods. Jamieson, Kelovkar, Sunalai and Mandke (2003) categorise solid waste by hotels into hazardous, biodegradable and non-biodegradable, and combustible and non-combustible waste. They affirm that each material should be assessed individually since the nature of these characteristics leads to different types of waste management approaches.

According to Mihalič (2000), hazardous waste contains harmful chemicals and produces harmful by-products when burned or placed in a landfill site. Common hazardous wastes in hotel facilities include paints, cleaners, oils, batteries and pesticides, all of which can have a severe impact on the environment if left untreated. Hazardous waste requires special treatment procedures before disposal and is not appropriate for ordinary on-site treatment, placement in open

landfill sites or burned in an uncontrolled manner. In some instances, hazardous waste disposal is regulated, for example, fines may be imposed for improper practices. However, in many countries, especially in more remote areas, WTTC et al. (2002) maintain that there is often little government regulation or inspection of hazardous waste treatment.

Biodegradable waste, such as food waste, contains organic substances, which can be broken down over time, treated and recycled into useful by-products such as biogas and compost. Non-biodegradable waste, such as textiles, chemicals, rubber and plastics do not have putrefaction properties (Jamieson et al., 2003). Biodegradation time depends on the type and nature of the substance and can range from a few weeks to many years. When wastes are placed in a covered landfill site, decomposition time can be significantly extended.

Hotels also produce tons of combustible and non-combustible waste. Radwan et al. (2010) observe that combustible waste such as paper, used oils, rubber and leather, has a high heat value, burns easily and releases heat energy when combusted. Non-combustible waste such as glass, aluminium and most organic waste, such as food scraps and garden trimmings, has a lower heat value and cannot be easily burned.

In Jamieson et al.'s (2003) view, before management can select appropriate waste management methods, an assessment of the facility's waste stream must be conducted. A waste audit guides an individual/team through the steps required to provide data on the composition and quantity of waste generated, disposed of and recycled. An audit can also supply information required to help

design an effective solid waste management programme. Typically a waste audit comprises determining the current volume of solid waste being produced at the hotel and assessing whether higher rates of reuse and recycling can occur.

Assessing a facility's solid waste management situation will help to determine the actual levels of solid waste being produced (UNEP, 2002). Jaimeson et al. (2003) further maintain that the assessment can be done on an overall basis, such as waste from the overall facility, or dealt with at a high level of precision, but this depends on the scale of a facility and the sophistication of its management and staff. In larger-scale facilities, this evaluation is often carried out in areas, such as food and beverage, accommodation and housekeeping. This provides the hotel with an assessment of its solid waste situation before considering and possibly introducing solid waste management procedures.

Solid waste management practices in hotels

UNEP (2008) reports that in 2001, the world's 692.5 million tourists produced 4.8 million tons of solid waste. As at 2011, Dodds (2011) maintains that this volume had undoubtedly increased due to several factors, including increasing waste production in hotels. As an evidence, Dodds asserts that the average hotel guest creates approximately 2-3 kg of waste per person per night. The environmental impact of solid waste, especially its improper disposal, is well documented by Moeller (2005) and Abdul-Jalil (2010) to include injection of toxins into underground water, aesthetic pollution, and other health implications. In order to guard against these impacts, hotels adopt different practices and

techniques to manage solid waste. These techniques broadly conform to reducing the volume of waste generated, recycling, reusing, recovery, and disposal.

In a cross-country study in Asia, Mensah (2006) found that waste reduction techniques adopted by hotels included collapsing cardboard boxes, sorting waste by type of material, crushing glass, and bailing paper and cardboard.. These were mostly done in the attempt to reduce the space taken up by solid waste. According to Chan and Lam (2001), waste reduction includes all actions taken to reduce the amount or toxicity of waste. It is classified to include waste prevention, recycling, composting, and the purchase of products that have recycled contents or produce less waste. IHEI (2002) notes that waste prevention is one of the easiest methods of reducing waste and can be controlled at the time of purchasing products and services. For example, Mihalič (2000) found that most hotels adopt purchasing and inventory policies that encourage purchase of recyclable stock and materials. In many other cases, hotels adopt re-use policies which encourage donations of reusable waste to other secondary users.

Shen and Zheng (2010) maintain that there is a direct correlation between what a hotel purchases and what it throws away. In addition, all of the resources and economic costs of materials, manufacturing, labour, transportation, packaging, storage and disposal are wasted when a product is discarded. In order to avoid wasting the economic value of purchases, some hotels engage in yard sales and auctions to recover some of the economic value of what might otherwise have been disposed off as waste. According to Tribe et al. (2000), it is now a

common practice for hotels to engage in direct sales of furniture, kitchen ware and other materials, or to sell them off through intermediaries, such as on e-bay.

Trung and Kumar (2005) observe that many hotels have policies regarding waste reduction for plastics, paper, polyethylene, and hazardous solid wastes. For example, the Radisson Hotel in Asheville, North Carolina has developed a 7R conservation policy where the 7Rs are: reject, reduce, reuse, reclaim, repair, replace, and recycle. In UNEP's (2008) study, it emerged that many hotels, in their effort to reduce paper waste, have adopted a centrally-placed and in some cases, electronic bulletin board for messages instead of making multiple copies of memos. In some cases, shredded office paper is reused to package shipments. Other specific techniques adopted by hotels include usage of electronic mails for correspondence when possible, and reusing envelopes and folders for routing in-house mail and correspondence. Many other hotels have policies discouraging the use of disposable cutlery, the use of toxic inks, bleach and chlorine papers, and toxic correction fluids.

Tang (2004) points out that waste reduction and waste prevention policies must be supported with environmentally friendly purchasing policies. For example, some hotels support their waste reduction policies with policies reinforcing purchase of paper and plastic products made from recycled material. Other policies may cover encouraging purchases of refillable pens and pencils rather than throwaways. Mihalič (2000) reports that Fairmont Hotel, in its reuse policies, annually diverts thousands of pounds of materials such as glass,

aluminium, plastic, newspaper, cardboard and compost to recycling depots and donates used soaps and amenities to local shelters and charities.

According to WTTC (2000), some eco-friendly hotel policies have specific waste reduction strategies for housekeeping, stores, administrative departments, and food and beverage departments. A study by Tang (2004) showed that some hotels urge their housekeeping departments to reduce waste through selecting vendors who take back reusable containers, pallets and other waste packaging, avoiding the use of plastic liners in ice buckets, and eliminating plastic bags and stickers on newspapers. In other cases, housekeeping was required to provide amenities such as shower caps and shoe wipes on request, re-dye stained bath towels and wash cloths for reuse as pool towels and cleaning cloths, and use reusable baskets for guest laundry, thus avoiding disposable paper or plastic wrap.

In a case study, Mihalič (2000) reported that Starwood Hotels and Resorts procured 'Green Products' through specific policies and practices. For example, the hotel challenges its builders and suppliers to review how their products and services are produced, packaged and delivered in order to create a more environmentally friendly product. There is also a policy that all paint, wallpaper, carpets and curtains should be free of toxic chemicals. Moreover, wooden furniture is painted with catalytic varnish through which harmful chemicals cannot penetrate. The hotel also uses bamboo, a sustainable product, which was used on the walls of the lobby area. Recycled materials feature strongly in the design process. For example 93 percent of recycled granite was used for the lobby

flooring; bed side tables were made from recycled wooden shipping pallets and the room number signs and parts of the lobby floor and front desk were fabricated from recycled glass.

Noor & Kumar (2014) notes that the effort to reduce waste through recycling, purchases, or any other policy framework will, to some extent, depend on the involvement of staff and guests in practicing waste management techniques. In some cases, Radwan et al. (2010) add that staff training programmes on waste management are organised as a separate workshop, or are implemented on the job. The purpose of these motivational programmes is to create opportunities for staff involvement and enthusiasm about waste reduction and recycling programmes.

Scanlon (2007) found that employee training programmes are often used as a strategy towards motivating staff for environmental awareness and educate employees on the hotel's environmental policies for its various departments. Staff training programmes as a strategy for waste reduction and prevention helps address employees' questions regarding the usefulness of waste management and the rationale for the involvement of all employees of the hotel. Some hotels, as found by Chan and Lam (2001), use incentives for employees who exhibit activity and leadership in their waste management programmes, as a strategy to involve staff in proper waste management methods. These rewards may be extended to departments that show exceptional involvement in waste reduction or recycling programmes.

Many other hotels make effort to give directives and tips to guests as a technique for managing solid waste. In order to increase guest involvement in proper waste management, Jaimeson et al. (2003) assert that hotels often place recycling instructions in guest rooms and locate recycling collection containers in convenient locations in convention halls and public areas throughout the hotel. A trash container is often placed along side recycling containers in public areas to avoid trash being thrown in the recycling bins.

In a case study, Mihalič (2000) reports that at the Radisson (a 281-room hotel), guests can take part in a waste reduction programmes by opting to keep the same sheets/towels for more than one night. If a special card is left on the bed, the housekeeper does not change the linen. This is accompanied by the training of housekeeping staff in their primary language and trial runs to ensure procedures are understood and followed. The programme saves person-hours, detergent, hot water, wear and tear on linens, washing machines, and dryers. Costs have also been reduced by 30 percent per load.

Mihalič (2000) observes that it is still pertinent for hotels seeking environmental conservation objectives to continue making improvements and investment in best low cost practices in solid waste management. This approach has been pursued by hotels through waste reduction and reuse techniques. Some hotels adopt reducing or eliminating the use of single-use items such as paper napkins and disposable plates, cups, cutlery, place mats, aprons and cook hats. Radwan et al. (2010) confirm that in most cases, disposable items can be easily

and cost-effectively replaced with durable items. For example, Radwan et al. (2010) recommends the use of durable coasters instead of paper napkins.

With respect to organic waste, especially from food and beverage departments, one technique has been to process the organic matter through composting and processing of food matter into animal feed. In this approach, Revilla, Dodd and Hoover (2001) propose that, it is important to link the production of compost heaps with a ready and available market to absorb the organic fertilisers and feed that is produced in order to ensure viability. In this aspect, the Palace Hotel in Tokyo is an example, since it is processing all its organic waste and owns a farm that has the potential to absorb all the fertiliser that will be produced (UNEP, 2008). The farm produce is then sold to the hotel for its guests' consumption. In Nairobi, Parkinson and Tayler (2003) reported that some hotels sell their kitchen waste to farmers to be used as feed for pigs and in some cases, compost for farmlands.

Some hotels do not engage in on-site waste management strategies. Kelly et al., (2007) explains that the reasons are mainly on-site solid waste management requires time as well as human and financial resources. Some hotels therefore see it as more time and cost efficient to sub-contract waste management to third parties. Many hotels therefore sign contracts with waste hauling firms, who take up the responsibility of transporting waste from hotel sites and also taking responsibility for any other management services. Tang (2004), for example, states that several hotels, mostly 5-star hotels, in Bali have signed contracts with

waste hauling companies. In some cases, the hotels sorted the solid waste recyclables from food matter, or plastics from glass.

Other studies show that some hotels practice improper waste management techniques. Afangideh, Kinuabeye and Atu (2012), for example, reported in their study that the majority of hotels in Nigeria practice open dumping and open burning of solid waste. According to Radwan et al. (2010), improper waste management can cause environmental degradation and loss of aesthetic appeal. The burning of garbage and substances, such as batteries, also releases smoke and hazardous substances, which can have adverse effects on the health of guests, staff, and nearby residents. Leachate from the incinerated waste can also contaminate soil, surface water and groundwater.

In Jamaica, the Sunset Jamaica Grande Hotel was reported to be engaged in dumping solid waste alongside roads and illegal places, which amounts to a \$10,000 fine by Jamaica's National Solid Waste Management Authority (Jamaica Observer, March 3, 2010 online edition). These forms of waste management often lead to adverse health and aesthetic implications and thus must be avoided.

The ongoing discussion reveals that solid waste management strategies in hotels may be similar in their approaches, but the specific techniques involved in these strategies do not conform to a specific norm. They may be conveniently categorised into waste prevention, reduction, and recycling. However, the techniques may vary with respects to their application to different types of solid wastes, and they may also vary among the departments of the hotels. However, it

is important that these waste management strategies inculcate staff and guest involvement.

Challenges of solid waste management by hotels

The rationale for waste management, in general, has been that improper waste management can lead to adverse environmental and health consequences. Residential and commercial set-ups have therefore been urged to adopt waste management strategies that can help reduce perceived unfavourable environmental and health implications (Nielson, 2007). Hotels are known to generate large amounts of waste, most produced by hotel guests. In the area of solid waste, some hotels have been successful with vibrant environmental policies that have helped in an eco-friendly and cost-efficient management of waste while others still struggle to get the basics right (Buhalis (2010); UNEP, 2008).

Chan and Lam (2001) report that many hotels do not have proper waste reduction or recycling programmes for solid waste, such as glass, paper, or plastic. Many other hotels do not practice waste segregation, thus making further waste separation and recycling difficult, even for waste haulers. For example in Nigeria, a study of 18 hotels revealed that none of the hotels studied practices waste separation before disposal and only about a third had a waste reduction programme. In a study conducted by Tang (2004), lack of source separation of solid waste increased inefficiencies in the recycling system because materials became contaminated and dispersed. Recycling through source separation has been found to provide more materials that are of better quality compared to waste picked out of mixed waste streams

In the cases of hotels that had a management programme for solid waste, employee commitment to waste management policies and inappropriate facilities to manage solid waste were revealed as major challenges (Tang, 2004). Employees' low commitment to uphold proper solid waste practices created problems for management and additional costs of training and making employees aware of the potential harm of improper solid waste management.

Another major challenge which often confronts hotels in their solid waste management efforts is the problem of financing waste management technology provision. According to Radwan et al. (2010), many small hotels see waste management as an additional cost. In many cases, most hotels cannot quantify the monetary value of proper waste management to their facility, and are thus not inclined to invest in recycling and purchasing recycled products, which are sometimes more expensive than other products. Radwan et al. further observe that in many other cases, the operational structure of hotels pose problems for waste management policies to operate. Hotels, like other business entities, operate within a budget. Thus, additional costs of waste management may be defrayed to enable the financing of other expenditure that may increase the dividends of shareholders.

Pearce (2008) maintains that top-down management processes often lead to bottlenecks. The diverse departmentalisation of hotel activities may also lead to several challenges, which may arise from possible confusion in the development of waste management strategies for different departments and waste materials. The channels of reporting and giving feedback, which are embedded in the

operational structures of the hotel to an extent, can determine the viability of the waste management programme adopted by the hotel. In Pearce's view, open management in which subordinates are free to adapt to different situations are often more viable than rigid management structures.

According to Tang (2004), one other problem which is often encountered in hotels' management of solid waste is guest compliance to waste management directives. Some guests may not be environmentally conscious, or simply refuse to comply with instructions. For example, a guest may choose or accidentally dispose of food matter into containers meant for recyclables. Radwan et al. (2010) add that in most cases non-compliant guests may not be identified, and those identified cannot be severely sanctioned, probably in order to secure repeat visits from the guest.

Waste management also requires the dedication of human resource for the constant monitoring of waste management programmes as directives may be easily overlooked by staff or guests (Tang, 2004). This may require additional time and dedication of financial resources. It may also mean additional responsibility to other staff, especially in cases where a special division or position is not created for monitoring waste management practices.

Conceptual framework for solid waste management

The conceptual framework guiding this study was developed by Jaimeson et al. (2003). According to the framework, solid management in hotels is a continuous process to cater for the production of solid waste by guests and the

various activities of staff from the various departments of a hotel. This process begins with a solid waste audit to determine the types of solid waste, whether biodegradable/non-biodegradable, combustible/non-combustible, or hazardous/non-hazardous, generated by the hotel. This will inform management on the type of solid waste management strategy to adopt. The solid waste management options available include waste recovery, waste reuse and recycling, green purchasing, waste reduction, and disposal. For the different compositions of waste, different waste management strategies will need to be adopted.

Several factors will, however, influence the adoption and successful implementation of the adopted waste management method. For example, the operational structures of the hotel may facilitate or hinder effective and imminent decisions regarding solid waste management by junior staff. Guests' participation and staff commitment to solid waste management programmes and directives will also affect the successful operation of solid waste management methods adopted by the hotel. Finally, the solid waste management programme operates within a stipulated budget and may be constrained by budget cuts and other contingent expenses that were not budgeted for.

A monitoring process to evaluate and oversee waste management in the hotel is essential for effective and proper solid waste management. This will require the dedication of human resource, time, and finance to a monitoring personnel or a monitoring team responsible for tracking progress and adherence of staff and guests to the waste management scheme of the hotel, which will also feed back into future waste management audits.

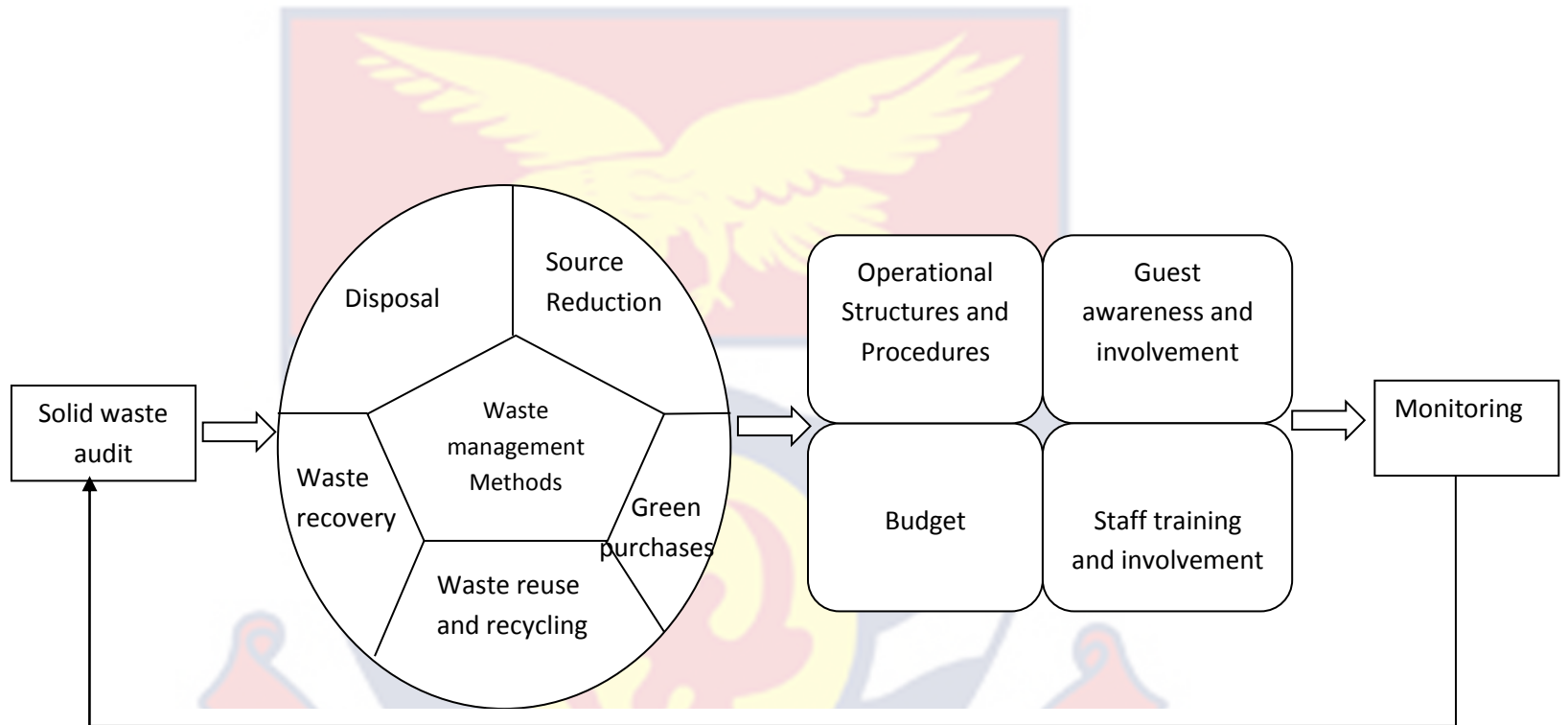


Figure 1: Solid waste management process

Source: Jamieson et al. (2003)

CHAPTER THREE

METHODOLOGY

Introduction

This chapter focuses on the methodology of the study. It presents the description of the study area, study design, study population, sample size, sampling procedure, sources of data, instruments for data collection, and the methods of data analysis.

Study area

Kumasi is the capital city of Ghana's Ashanti Region. It is located near Lake Bosomtwe, in the rain forest region about 250 kilometres (by road) northwest of Accra. Kumasi is approximately 480km north of the Equator and 677km north of the Gulf of Guinea. Kumasi is endowed with several tourist attractions of cultural, historical and aesthetic value. This, coupled with a vibrant economic and business sector, encourages trade and travel which also encourage a vibrant commercial accommodation sector (Kumasi Metropolitan Assembly, 2006).

According to Ghana Tourism Authority (GTA, 2010), several hotels, guesthouses, and other commercial lodging facilities have been established to cater for the growing demand in the accommodation sector. According to Ghana Tourism Authority (2010), there are 354 hotels in Ashanti Region. Kumasi alone

contains one 4-star hotel, six 3-star hotels, forty-two 2-stars, forty-one 1-star hotels and countless other budget (unrated) hotels. These hotels are required to conform to the Environmental Assessment Regulations provided in the Environmental Protection Agency Act 490 of 1994 and Act LI 1652 of 1999, which spells out environmentally sustainable approaches to waste management in the country.

Research design

The study adopted a mixture of quantitative and qualitative approaches. This was to enable the use of methods that support quantitative and qualitative approaches to data collection and analysis (Robson, 2013). The study also employed descriptive design, which refers to a research design that aims at describing social systems, relations or social events and providing background information about the issue in question and also to stimulate explanations (Sarantakos, 2012). The study therefore attempted to describe the existing solid waste management practices among hotels in the Kumasi metropolis.

A cross-sectional design was also adopted for the study. According to Levin (2006), a cross-sectional study is employed for studies covering relatively short periods. It is therefore a quick way to ascertain existing conditions of a particular phenomenon, especially through field surveys. It may however not cover adequate data on previously existing situations and it is not a recommended option for making predictions and introducing interventions (Levin, 2006). Thus, cross-sectional study is best suited to studies aimed at finding out the prevalence

of a phenomenon, situation, problem, attitude or issue by taking a cross section of the population (Babbie, 2007). The ultimate goal of the study is therefore to describe the solid waste management techniques of hotels in Kumasi at the particular time the survey was conducted.

Study population

The study population covered all hotels in the Kumasi metropolitan area. However, only registered hotels were targeted by the study in order to make it easier to obtain a sampling frame from GTB records and also to make the identification of the hotels relatively easier. GTB (2009) reports that there are 217 hotels in the Kumasi Metropolitan Area that are registered with the Ghana Tourism Authority. General Managers of the hotels were targeted. The study population therefore comprised of 217 hotel managers. However, only star rated hotels were targeted by the study. Statistics indicate that there were 97 star-rated hotels in Kumasi (GTB, 2009) and the managers of these hotels were targeted by the study. The study conducted a census of all the targeted hotel managers, thus, all 97 hotel managers were included in the survey.

Sources of data

The study needed data on the composition of solid waste of the hotels, the solid waste management techniques, and the challenges confronting hotels in solid waste management. The study required both primary and secondary data.

Primary data on the solid waste management practices of hotels were solicited from hotel managers. This related to the existing conditions of solid waste policies, plans, waste management systems, and stakeholder collaboration.

Secondary data for the study was solicited from hotel managers on the policies, costs, and documented responsibilities of human resources designated to waste management.

Instruments for data collection

The study used questionnaire to elicit data from the hotel managers. The questionnaire was divided into four sections. Section A covered the hotel profile. Section B concentrated on categorising the types of solid waste generated by hotels. Section C solicited data on the solid waste management practices of the hotels and Section D gathered data on the challenges that confront hotels in managing solid waste. The study used observation to collect observable data on the waste composition, the state of bins, and the management practices of solid waste in the hotels.

Pre- testing

Selected hotels in the Bekwai Municipal Assembly were used to pre-test the questionnaire prior to final distribution. Ten questionnaires were distributed during the pre-test. The rationale was to check for reliability of the instruments. It also ensured that the instruments were accurate and understandable to the respondents. Pre- testing revealed and helped to solve problems such as phrasing,

sequencing and ambiguity. The pre-test helped to restructure the items on the questionnaire to solicit needed data for the study.

Ethical issues

The research sought a letter of introduction from the Institute for Development Studies, University of Cape Coast. This was sent to the management of the hotels in the Metropolis in order to gain their consent and to acquire permission to conduct the study. This enabled the researcher to gain the needed support or co-operation from the management of the hotels. The researcher made sure to explain the purpose of the study to all participants and only included them in the study based on their informed consent. The respondents were assured of their confidentiality.

Fieldwork

The fieldwork was conducted from 15th to 22nd August, 2012. The self-administered questionnaires were sent to the 97 hotel managers in the Kumasi Metropolis. The participants were encouraged to complete the questionnaires within a week. The researcher paid subsequent visits to the premises after the initial delivery of the questionnaires. During these visits, completed questionnaires were collected while discussions were held to help some of the managers who had difficulties with understanding the issues raised in the questionnaire. This was repeated for four weeks.

Field challenges

A major challenge was getting sufficient number of the questionnaires completed and returned within the time scheduled. There were some non-responses and non-cooperation from some of the hotel managers, thus data from the entire target population could not be obtained. In addition, some of the received questionnaires had unanswered items. Such questionnaires were returned to the respondents and the researcher offered some assistance to the respondents to answer those items.

Data analysis and presentation

Appropriate statistical tools in Statistical Product for Service Solutions (SPSS, version 16) computer software was used to analyse the data. Descriptive statistical tools were used to describe the common solid waste management practices among hotels. Associations between guests' environmental concerns and their choice of hotels were tested for significance using chi-square. Other assumed cause-effect relationships were tested using regression. The results were presented in tables, charts, and figures.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the results and discussion of the study in relation to the techniques of solid waste management among hotels in the Kumasi Metropolis. The results of statistical significance and practical implications of the results are presented and discussed in relation to the specific objectives. The study targeted 97 hotel managers, but 54 hotel managers were successfully covered by the study. This represented a response rate of 55.7 percent. The first section of the analysis presents the profiles of the hotels, while the subsequent sections focus on the specific objectives of the study.

Hotel profile

The study provided background information of the hotels, with regards to their ratings, their size as indicated by the number of rooms and the number of employees, as well as the types of services they offer. These variables were studied in order to provide the context within which the study was conducted, in order to allow for replication of the study and any comparison of the results to similar studies. The variables, which were captured under the hotel profile was also important for differentiating between responses, since aggregated responses may exclude some pertinent isolated concerns.

The profile of the hotels is analysed in Table 1. The study captured more 1-star hotels (46.3%) in the sample than any other rated hotel. The least represented were 3-star hotels. The results further showed that, on the average, the hotels in the sample had between 18 and 60 rooms. The findings reflected the general proportions of hotels in the Kumasi metropolis, where 1-star hotels dominate in terms of their frequency, as indicated by the GTB (2009).

The smallest hotel, in terms of room numbers was a 1-star hotel with 18 rooms, while the largest was a 3-star hotel with 60 rooms. The size in terms of number of rooms was tested for normality and the results showed a mean of 30.69, a median of 26.00 and a mode of 38.00. For this distribution, a skewness statistic of 0.971 was given. According to Pallant (2005), the theoretical skewness statistic for normality is a value of 0.000, which indicates that the mean, median, and mode, calculated for the distribution had the same statistical value. However, given the fact that a skewness of 0.000 may not always be achievable, a value of ± 0.5 is often statistically accepted as normality. In the case of the number of room of the hotels, the distribution was not normal and upon Pallant's (2005) recommendation, the medians were adopted as the representative averages.

The average number of rooms for the hotels was therefore 26, but 1-star hotels had the least average number of rooms of 20 and 2-star hotels had the highest of 38. Based on Kruskal Wallis H test, it was found that, with a chi-square of 34.349 and a p-value of 0.000, the study indicated that the differences in the number of rooms, according to the ratings of the hotels, were statistically significant at an alpha of 0.05.

Table 1: Hotel categories and number of rooms

Hotel				Mean	Median	Mode	Skewness
category	%	Min	Max				
1-star	46.3	18	26	21.36	20.00	20.00	0.327
2-star	42.6	37	40	38.26	38.00	40.00	0.525
3-star	11.1	21	60	34.67	23.00	20.00	0.959
Total	54	18	60	30.69	26.00	20.00	0.971

n= 54; Chi-square = 34.349; df = 2; p-value = 0.000

Source: Field survey, 2012

The study also examined the employee size of the hotels, as this, in some cases has been found to be related to differences in the waste management practices of hotels (WTTC et al., 2002). The results showed that the employee size of 1-star, 2-star and 3-star hotels, as shown in Table 2, was between five and 30 employees. Subjecting the distribution to test of normality showed that, with a skewness of 0.957, the number of rooms was not normally distributed and as such the medians were used as the representative averages. Table 2 therefore showed that the number of employees increased with increment in the star ratings of the hotels. Based on Kruskal Wallis H test, it was found that, with a chi-square of 21.372 and a p-value of 0.000, the differences in the employee size of the hotels, based on their star ratings were statistically significant at an alpha of 0.05. Thus, the study affirms that employee size is a significant factor in the determination of the star ratings of hotels (Trung & Kumar, 2005).

Table 2: Hotel categories and employee size

Hotel		Mean	Median	Mode	Skewness		
categories	%	Min	Max				
1-star	46.3	5	20	10.60	9.00	5.00	0.971
2-star	42.6	12	17	13.86	13.00	10.00	0.777
3-star	11.1	19	30	23.33	21.00	15.00	0.843
Total	54	5	30	15.35	13.00	10.00	0.957

N = 54; Chi-square = 21.372; df = 2; p-value = 0.000

Source: Field survey, 2012

The hotel profile also covered the types of services which they offered, as the different services may be associated with different types of wastes and their management methods (Shankin, Petrillose & Pettay, 1991). Furthermore, it was also possible that the hotels with a wider range of services may generate more waste than their counterparts with a narrower range of services. Table 3, presents the results on the services offered by the hotels. This was disaggregated by the star ratings in order to identify any observed differences in the services offered. It was noted that besides offering beds to guests, 56 percent of the 1-star hotels offered food and beverage services, 64 percent also offered conferencing. On the other hand, all the 2-star hotels offered food and beverage services and conferencing but only 47.8 percent had gyms or other leisure activities for guests.

Table 3: Services offered by hotel category

Services	Ratings					
	1-star		2-star		3-star	
	Yes f(%)	No f(%)	Yes f(%)	No f(%)	Yes f(%)	No f(%)
Food and beverage	14(56)	11(44)	23(100)	0(0.0)	6(100)	0(0.0)
Conferencing	16(64)	9(45)	23(100)	0(0.0)	6(100)	0(0.0)
Gym/Leisure activities	0(0.0)	25(100)	12(47.8)	11(52.2)	6(100)	0(0.0)

Source: Field survey, 2012

All the 3-star hotels had food and beverage services, conferencing, as well as gym and leisure activities. The study showed that the number and types of services increased with hotel ratings. Thus, the study confirmed the fact that the variety of services offered by hotels may be a significant factor in determining the star ratings of hotels Shen and Zheng (2010).

Composition of solid waste generated by hotels in Kumasi

The types of solid waste have implications for the management system and approaches used by hotels (Radwan et al., 2010). Radwan et al. add that the differences in the waste according to their organic component, toxicity, plasticity or ferocity may cause significant differences in the approaches used to manage the

waste. Thus, the study found it important to examine the types of solid wastes generated by the hotels a basis for analysing the management techniques used.

The respondents indicated the types of wastes generated by the hotels, as shown in Table 4. The responses were analysed by multiple response frequencies and it emerged that 35.1 percent of the responses pointed to plastics as the most commonly generated solid waste by the hotels. This was followed by organic waste, which refers to food waste (32.4%), and then paper waste (23%). No hazardous waste was indicated in the results, but Scanlon (2007) notes that ferrous metals may cause harm through rust if not managed properly.

Table 4: Types of solid waste generated by the hotels

Waste	Hotel category			Total
	1-star f(%)	2-star f(%)	3-star f(%)	
Plastics	25(35.7)	23(37.1)	4(25.0)	52(35.1)
Organic	29(41.4)	15(24.2)	4(25.0)	48(32.4)
Paper	12(17.1)	16(25.8)	6(37.5)	34(23.0)
Ferrous metal	0(0.0)	8(12.8)	0(0.0)	8(5.4)
Glass and ceramic	29(5.7)	0(0.0)	2(12.5)	6(4.1)

Source: Field survey, 2012

The results were disaggregated by the hotel categories, and it was noted that while a greater section of the responses (41.4%) from 1-star hotels indicated that, that category of hotels produced organic waste, there were more responses (37.1%) from managers of 2-star hotels that indicated that plastics were the most

commonly generated solid waste. Half of the responses from the 3-star hotels, however, referred to plastics (25%) and organic waste (25%) as the most frequently generated waste in their hotels. The results from the study generally confirmed the regular types of solid waste produced by hotels, as noted by Chan and Lam (2001).

The waste generated by the hotels was further examined according to the volumes generated per day. The estimates of the volumes were based on how the hotel managers rated the wastes in terms of volume generated. The ratings were analysed using Friedman Rank test as shown in Table 5. According to the results, the managers generally rated plastics as the most generated waste by volume. This was indicated by a Friedman Rank of 7.8. This was followed by paper waste (6.8) and organic waste (6.5). This therefore indicated that the solid waste management techniques of the hotels are expected to be suitable for plastics, paper and organic wastes. Noor & Kumar (2014) indicates that the most appropriate method for managing plastic and paper waste is recycling, even though composting is cited as the most environmentally sound means of managing organic waste.

The disaggregated results, on the other hand, showed that the managers of the 1-star hotels and 3-star hotels rated organic waste as the most generated solid waste in their facilities. The test for statistical significance showed that the differences in the ratings of the volumes of solid waste generated within 1-star hotels, were statistically significant at an alpha of 0.05 (chi-square = 49.000; p-value = 0.000). It was also statistically significant for 3-star hotels at an alpha of 0.05 (chi-square = 58.100; p-value = 0.000).

Table 5: Solid waste generated by volume

Waste	Friedman Rank			Overall n=54
	1-star n= 25	2-star n=23	3-star n=6	
Plastics	5.4	8.0	7.7	7.8
Paper	6.9	7.1	7.3	6.8
Organic	7.6	5.4	7.9	6.5
Glass	3.4	4.3	3.0	4.1
Aluminium	1.5	3.9	4.0	3.2
Textile	2.6	2.5	3.9	3.1
Metal	1.1	3.6	3.2	2.8
Wood	1.2	1.4	1.8	1.2
Chi-square	49.000	58.100	45.200	56.000
df	7	7	7	7
p-value	0.000	0.000	0.000	0.000

Source: Field survey, 2012

The implication was that within 1-star and 3-star hotels in the Kumasi metropolis, more organic waste was generated than any other type of solid waste. It was also shown that plastic waste (Friedman Rank = 8.0) was rated by the managers of the 2-star hotels as the most generated solid waste, in terms of volume. The differences in the ratings were statistically significant at an alpha of 0.05 (chi-square = 56.000; p-value = 0.000).

Following this, the study examined the major sources of solid waste within the hotels. The results are presented in Figure 2. According to the study, the departments in the hotels that produced most of the solid waste, were the food and beverage department, housekeeping and the front office. On the other hand, the most prominent solid wastes generated by the hotels were organic, plastics and paper. Figure 2 shows that all organic wastes were generated by the food and beverage department, while all plastic wastes were generated by the housekeeping department. The front office only generated 37.5 percent of paper waste in the hotels. The identified wastes and their sources of the solid wastes were also noted by Tang (2004) and Jamaica Observer (2010) in studies in Thailand and Jamaica respectively.

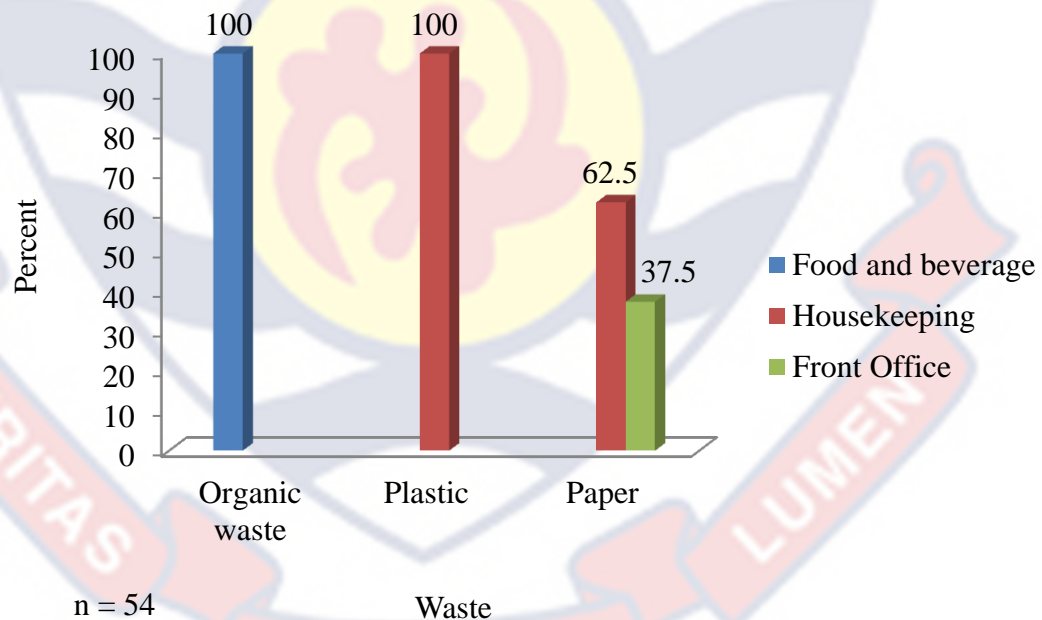


Figure 2: Wastes generated by the hotel departments

Source: Field survey, 2012

The conceptual framework of the study refers to solid waste audit as the first step in solid waste management. According to the IHEI (2002), the audit is rationalised by the fact that an inventory of the wastes generated can help in determining the overall strategy which is appropriate for managing the wastes. According to this study, plastics, organic waste and paper wastes are the most prominent types of wastes generated by the hotels. This feeds into the waste management methods, which are examined in the next section.

Solid waste management strategies used by hotels

The conceptual framework points to disposal, source reduction, waste recovery, reuse and recycling, as well as green purchases as some forms of waste management strategies. According to Chan and Lam (2001), these strategies are founded on the assumption that their right application can reduce the detrimental effects of wastes on the environment. Based on the waste audit, this study examined the waste management strategies of the hotels.

The study first examined the environmental policy of the hotels, which Shen and Zheng (2010) indicate as the fundamental guide towards solid waste management. The study found that 57.4 percent of the hotels did not have an environmental policy to guide their solid waste management strategies. In the disaggregated responses, it was shown that as high as 88 percent of the 1-star hotels did not have an environmental policy to guide their solid waste management strategy. On the other hand, 69.9 percent of the 2-star hotels and 66.7 percent of the 3-star hotels had an environmental policy. Thus, the study

found that the solid waste management practices of most of the lower level hotels within the Kumasi metropolis were not guided by an environmental policy. In such cases, Radwan et al. (2010) found that waste management practices are often misguided and do not conform to standardised approaches. The implication for the study is that most of the hotels may be embarking on unacceptable solid waste management practices.

Table 6: Hotels with/without an environmental policy

Response	Ratings			Total
	1-star	2-star	3-star	
	f(%)	f(%)	f(%)	f(%)
Yes	3(12.0)	16(69.9)	4(66.7)	23(42.6)
No	22(88.0)	7(30.4)	2(33.2)	31(57.4)
Total	25(100.0)	23(100.0)	6(100.0)	54(100.0)

Chi-square = 17.835; df = 2; phi = 0.575; p-value = 0.000

Source: Field survey, 2012

Further statistical tests (chi-square = 17.835; p-value = 0.000) revealed that there was a statistically significant relationship between the hotel ratings and the propensity to possess had an environmental policy. Furthermore, a phi-statistic of 0.575, according to Rea and Parker's (2004) classification showed that there was a strong association between the hotels' ratings and their ownership of an environmental policy. Thus, based on the nature of the responses, the study found that hotels with higher ratings were likely to have an environmental policy which

guided their solid waste management strategies. Similar results were found by Revella et al. (2001) in hotels in Mexico.

The study also explored the institutions that were responsible for designing the environmental policies of the hotels. The results covered the 23 hotels that had environmental policies (Table 7). It was found that the environmental policies of the hotels were either designed by EPA or the management of the individual hotels. In general, however, the EPA designed the environmental policies for 52.2 percent of the hotels that were studied. This covered all the 1-star hotels, half of the 2-star hotels and a quarter of the 3-star hotels.

Table 7: Institutions that designed environmental policies for hotels

Institution	Hotel category			Total
	1-star	2-star	3-star	
	f(%)	f(%)	f(%)	f(%)
EPA	3(100.0)	8(50.0)	1(25.0)	12(52.2)
Hotel management	0(0.0)	8(50.0)	3(75.0)	11(47.8)
Total	3(100.0)	16(100.0)	4(100.0)	23(100.0)

Chi-square = 3.964; df = 2; p-value = 0.138

Source: Field survey, 2012

With a chi-square statistic of 3.964 and a p-value of 0.138, the study showed that the distribution of responses in Table 7 was not statistically significant at an alpha of 0.05. Generally, therefore the study revealed that the institutions which were responsible for designing environmental policies for the

hotels were similar for 1-star, 2-star and 3-star hotels within the Kumasi metropolis.

In similar studies, it has been found that environmental policies for hospitality industries are often guided by general environmental laws for businesses (Tribe et al., 2000). In some cases, hospitality businesses supplement their environmental policy with an internally designed system, which are aimed at guiding on-site management. The current study therefore confirmed that environmental policies for hospitality businesses such as hotels were often guided by environmental laws made by the environmental protection authorities.

The conceptual framework emphasises several waste management strategies, including source reduction, waste recovery, recycling and disposal. These were analysed in terms of their usage by the hotels in Kumasi Metropolis. According to the study, 53.7 percent of the managers responded that their respective hotels made efforts in waste prevention (Table 8). For most of the 1-star and 2-star hotels, the managers noted that they made very high efforts in preventing waste generation. In addition, 33.3 percent of the respondents from 3-star hotels noted that they made very high efforts in waste prevention. The results therefore revealed that waste prevention was a strategy adopted by most of the hotels in the study. In some cases, in hotels within the African sub-regions, waste prevention forms part of the core waste management approaches (Asi & Busch, 2011). The current study therefore found similar results.

Table 8: Waste prevention techniques used by the hotel category

	Hotel category				Chi-square (p-value)
	1-star f(%)	2-star f(%)	3-star f(%)	Total f(%)	
Effort to prevent waste					
Very high	12(48.0)	15(65.2)	2(33.3)	29(53.7)	6.954 (0.138)
Fairly high	9(36.0)	8(34.8)	2(33.3)	19(35.2)	
Fairly low	4(16.0)	0(0.0)	2(33.3)	6(11.1)	
Prevention technique					
Buy-less-use-less	4(16.0)	8(34.8)	0(0.0)	12(23.1)	45.217 (0.000)
Using recyclable material	0(0.0)	8(34.8)	2(50.0)	10(19.2)	
Re-using waste	21(84.0)	7(30.4)	0(0.0)	28(53.8)	
Sale of old equipments	0(0.0)	0(0.0)	2(50.0)	2(3.8)	

Source: Field survey, 2012

The solid waste prevention techniques used by the hotels were also examined. The purpose was to identify any disparities in the hotels, with regard to their solid waste prevention techniques. Thus, as shown in Table 8, the results were disaggregated by the hotel ratings. The waste prevention methods identified were buy-less-use-less approach, using recyclable material, re-using waste, and selling off old equipments. Overall, 53.8 percent of the managers responded that their respective hotels re-used waste in order to reduce the waste generated. On

the other hand, only 3.8 percent of the hotels practiced selling off their unwanted assets.

The disaggregated data on the other hand showed that source reduction or buy-less-use-less approach and reusing waste were common to 1-star and 2-star hotels. On the other hand, using recyclable material was common to 34.8 percent of the respondents from 2-star hotels and 50 percent of the 3-star hotels. With a chi-square of 45.217 and a p-value of 0.000, the study revealed that the differences in the practice of solid waste prevention techniques among the hotels were statistically significant at an alpha of 0.05. The study therefore revealed that a significant majority of 1-star hotels (84%) practiced re-using of waste, in comparison with the other hotels. Similarly, a significant majority of 2-star hotels were more into source reduction. On the other hand, a higher fraction of 3-star hotels practiced using recyclable materials in order to prevent waste generation, as compared to the other hotels in the study. In some studies on hospitality businesses, the identified waste prevention techniques are also noted as the common methods used by hotels to prevent the generation of solid waste (WTTC, 2000). Therefore the results of the study only confirm such earlier studies.

The use of recycling among the hotels was also examined as shown in Table 8. The results indicated that as high as 85.2 percent of the hotels did not use recycling as a strategy to manage solid waste (Table 9). It was found that none of the 1-star and 3-star hotels adopted recycling, and only 34.8 percent of the 2-star hotels used recycling as a solid waste management strategy. The results further showed that the distribution of responses in Table 8, was statistically significant at

an alpha of 0.05 (chi-square = 12.658; p-value = 0.002). Generally, therefore, recycling was not a popular waste management strategy among the hotels. This may be explained by the fact that, generally recycling is not well developed in Ghana, as Tsiboe and Marbell (2004) indicate the limited avenues to recycle waste within the country.

Table 9: Possession of recycling policy by category

Response	Hotel categories			Total
	1-star	2-star	3-star	
	f(%)	f(%)	f(%)	f(%)
Yes	0(0.0)	8(34.8)	0(0.0)	8(14.8)
No	25(100.0)	15(65.2)	6(100.0)	46(85.2)
Total	25(100.0)	23(100.0)	6(100.0)	54(100.0)

Chi-square = 12.658; df = 2; p-value = 0.002

Source: Field survey, 2012

The study further noted that only plastics were recycled by the hotels that adopted recycling to manage solid waste. This represented a narrow application of recycling as recycling also applies to some of the waste materials that were identified in the waste audit of the hotels. For example, paper, aluminium and ferrous metals identified by the waste audit can also be recycled. A similar approach is reported by Mihalič (2000) for Fairmont Hotel managers who annually divert thousands of tonnes of materials such as glass, aluminium, plastic, newspaper, cardboard and compost to recycling depots.

Given that organic waste and waste paper were generated in higher volumes besides plastics, in the hotels, the study examined the management techniques for managing organic waste and paper within the hotels. For organic wastes, disposal by contracting waste management firms was unanimously reported by the hotel managers. However, Kelly et al., (2007) and Parkinson and Tayler (2003) note that composting is the most environmentally acceptable means of managing organic waste in both domestic and institutional.

As shown in Table 10, the primary means of managing waste paper were either burning or disposal. However, most of the hotels disposed off their waste paper (85.2%) as against burning them (14.8%). It was found that burning of paper waste was only practiced by (32%) of 1-star hotels, while disposal was popular among the other hotel categories. Similar findings have been reported for hotels in Nigeria (Afangideh et al., 2012).

Table 10: Techniques for managing paper waste by the hotel categories

Technique	Hotel categories			Total
	1-star	2-star	3-star	
	f(%)	f(%)	f(%)	f(%)
Burning	8(32.0)	0(0.0)	0(0.0)	8(14.8)
Disposal	17(100.0)	23(100.0)	6(100.0)	46(85.2)
Total	25(100.0)	23(100.0)	6(100.0)	54(100.0)

Source: Field survey, 2012

Challenges hotels face in managing solid waste

Buhalis (2000) notes that hotels generate large amounts of waste, and that some hotels have been successful with vibrant environmental policies that have helped in an eco-friendly and cost-efficient management of waste, while others still struggle to get the basics right. In most cases, there are several challenges that prevent hotels from proper waste management. This study therefore assessed some of these challenges with respect to hotels in the Kumasi Metropolis.

Generally, the primary challenges to effective solid waste management in the hotels, as shown in Table 11, were high cost of waste management and insufficient staffing needs. However, 85.2 percent of the managers referred to high waste management costs as their primary challenge, and this was supported by all the managers of 1-star and 2-star hotels.

Table 11: Challenge to solid waste management by hotel category

Challenge	Hotel category			Total
	1-star	2-star	3-star	
	f(%)	f(%)	f(%)	f(%)
High cost of waste management	25(100.0)	15(65.2)	6(100.0)	46(85.2)
Insufficient staffing needs	0(0.0)	8(34.8)	0(0.0)	8(14.8)
Total	25(100.0)	23(100.0)	6(100.0)	54(100.0)

Source: Field survey, 2012

According to Radwan et al. (2010), many small hotels see waste management as an additional cost. Therefore, financing waste management technology provision often becomes a challenge to waste management in hotels.

The managers in the current study also noted several other challenges that they faced in managing waste in their hotels. The study showed that for 70.3 percent of the managers, inadequate staffing posed either serious (25.9%) or very serious (44.4%) challenge to their solid waste management systems. This was common to all the hotels studied (Table 11). According to Tang (2004), the problem of staff may be serious because waste management requires the dedication of human resource for the constant monitoring of waste management programmes as directives may be easily overlooked by staff or guests. It may require additional time and responsibility, which some staff may not be willing to assume, especially in cases where a special unit or position is not created for monitoring waste management practices.

Further examination of Table 12 showed that poor institutional arrangement to monitor solid waste management was also a serious challenge for 55.6 percent of the hotels. This was supported by 52 percent of 1-star hotels and 65.2 percent of 2-star hotels. Weak institutional arrangement, according to Kelly et al., (2007), accounts for weak regulations, which, according to 53.1 percent of the respondents, was a serious challenge to solid waste management system. In Todd and Hawkins' (2007) analysis, weak regulations, in general, lead to poor environmental and waste management systems that make it difficult for organisations to know and apply legal issues on waste management.

Table 12: Other challenges to solid waste management by the hotel categories

Challenge	Hotel category			Total f(%)
	1-star f(%)	2-star f(%)	3-star f(%)	
Inadequate trained staff				
No problem	0(0.0)	0(0.0)	2(33.3)	2(3.7)
Not serious	4(16.0)	8(34.8)	2(33.3)	14(25.9)
Serious	4(16.0)	8(34.8)	2(33.3)	14(25.9)
Very serious	17(68.0)	7(30.4)	0(0.0)	24(44.4)
Poor institutional setup				
No problem	0(0.0)	0(0.0)	2(33.3)	2(3.7)
Not serious	4(16.0)	8(34.8)	2(33.3)	14(25.9)
Serious	13(52.0)	15(65.2)	2(33.3)	30(55.6)
Very serious	8(32.0)	0(0.0)	0(0.0)	8(14.8)
Weak regulation				
No problem	0(0.0)	0(0.0)	2(33.3)	2(4.1)
Not serious	4(20.0)	7(30.4)	0(0.0)	11(22.4)
Serious	16(80.0)	8(34.8)	2(33.3)	26(53.1)
Very serious	0(0.0)	8(34.8)	2(33.3)	10(20.4)
Low guest cooperation				
No problem	0(0.0)	0(0.0)	4(66.7)	4(7.4)
Not serious	13(52.0)	15(65.2)	2(33.3)	30(55.6)
Serious	12(48.0)	8(34.8)	0(0.0)	20(37.0)

Source: Field survey, 2012

According to Tang (2004), one other problem which is often encountered by hotels in the management of solid waste is guest compliance to waste disposal directives. Some guests may not be environmentally conscious, or simply refuse to comply with instructions. For example, a guest may choose or accidentally dispose of food matter into containers meant for recyclables. In this study, guest cooperation was found to pose a serious challenge to 37 percent of the hotels as against 55.6 percent that stated that guest cooperation was not a serious challenge to their solid waste management system.

In view of the challenges, the managers had some suggestions for the improvement of the solid waste management in the hotels (Figure 3). A total of 36 respondents made some suggestions. About 58 percent of the respondents suggested strengthening the law enforcement and regulations on waste management in hotels. Others (19.4%) added that shareholders must cooperate with management to approve funds and investments into waste management in general. In a cross country study, Tang (2004) emphasise that investments into waste management techniques is a guarded means of improving waste management in organisations. Thus, the findings of the study are in line with some general recommendations which are already noted by other similar studies.

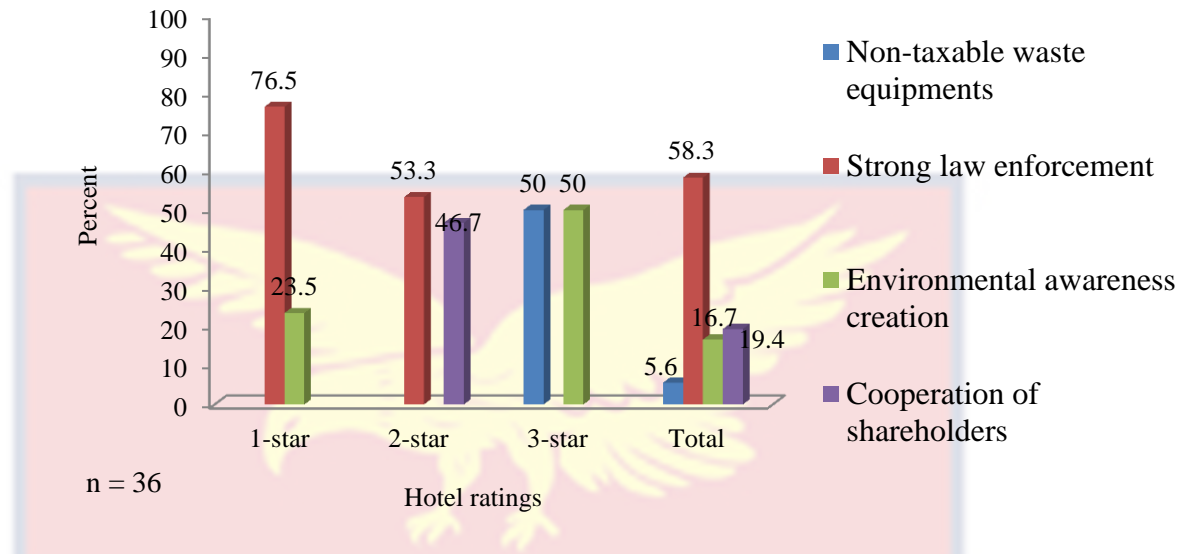
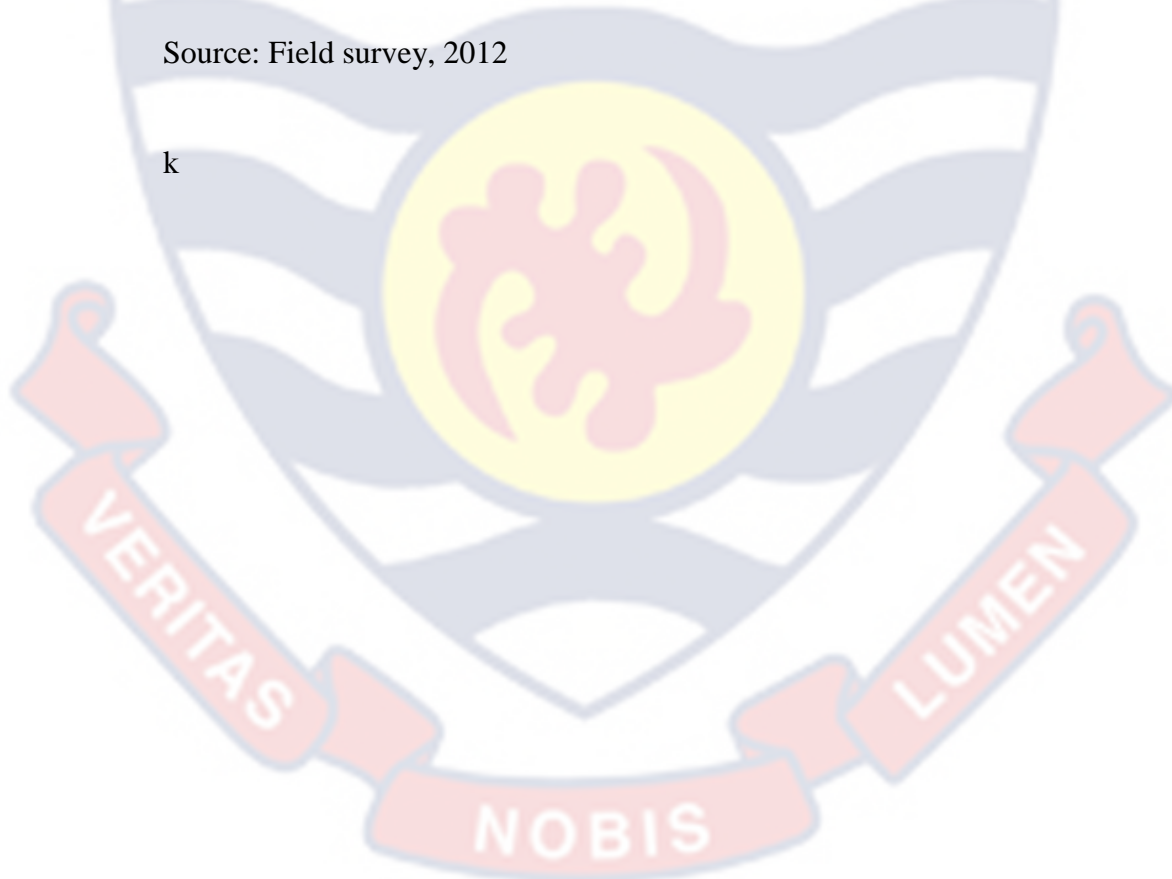


Figure 3: Suggestions to improve solid waste management in hotels

Source: Field survey, 2012

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CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary of major findings of the study. It also presents the conclusions drawn from the study as well as recommendations based on the findings. The first section of the chapter summarises the entire study and also presents the key findings. This is followed by the conclusions and recommendations drawn from the findings. Suggestions for further studies are added in the end.

Summary

The study set out to examine the techniques of solid waste management among star-rated hotels in the Kumasi Metropolis. A cross-sectional design was adopted to study 54 managers of hotels in the metropolis. Questionnaires were used to collect data from the managers and the data were analysed using means, medians, frequencies, and percentages. Kruskal Wallis H test and chi-squares with their associated p-values were used to test for the statistical significance of the association and differences between the study variables.

As the first objective, the study examined the composition of solid waste generated by hotels in the metropolis, and the major findings were that:

1. The solid wastes generated by the hotels included plastics, organic, paper and metallic wastes.

2. Plastics formed the highest proportion of the waste generated in the hotels. This was true for 35.7 percent of 1-star hotels, 37.1 percent of 2-star hotels and 25 percent of the 3-star hotels.

3. 1-star and 3-star hotels mostly generated organic waste while 2-star hotels mostly produced plastic waste.

4. The departments responsible for generating most of the solid waste in the hotels were food and beverage, housekeeping and front office.

The second objective explored the strategies used to manage solid waste in the hotels, and it was found that:

1. Most of the hotels did not operate with an environmental policy. However, a higher percentage of 2-star (69.9%) and 3-star (66.7%) hotels had environmental policies.

2. The environmental policy of the hotels was mostly designed by the Environmental Protection Agency, but for 75 percent of the 3-star hotels that had an environmental policy, the hotel management was the primary body for designing environmental policies.

3. Most of the hotels noted that they made efforts to prevent waste generation, especially through reuse of waste material. The specific waste prevention techniques included source reduction, re-use, using recyclable materials and sale of old equipments.

4. More than 85 percent of the hotels did not practice recycling as a waste management option. A few however sold plastics to collectors for recycling firms.

5. Organic waste was only disposed off and paper wastes were either burned or disposed off.

The final objective examined the challenges that the hotels face in their solid waste management system, and the major findings were that:

1. The primary challenge was the high cost of waste management and this was supplemented by the insufficiency of staff needed to manage the waste.
2. Other challenges were poor institutional setup of regulatory bodies and weak environmental laws.

Conclusions

The conclusions of the study are drawn from the major findings and in relation to the research questions. The study concluded that hotels in Kumasi generate different types of solid waste, namely, plastics, organic waste, paper and metallic wastes. However, plastics formed the highest, in terms of the volumes produced. In most cases, the hotels used waste prevention strategies, such as source reduction, re-use, using recyclable materials and sale of old equipments, to reduce the generation of waste. The waste management strategies were however, challenged by the high cost of managing solid waste and insufficient staffing needs for waste management. Other challenges were poor institutional setup of regulatory bodies and weak regulations of environmental law.

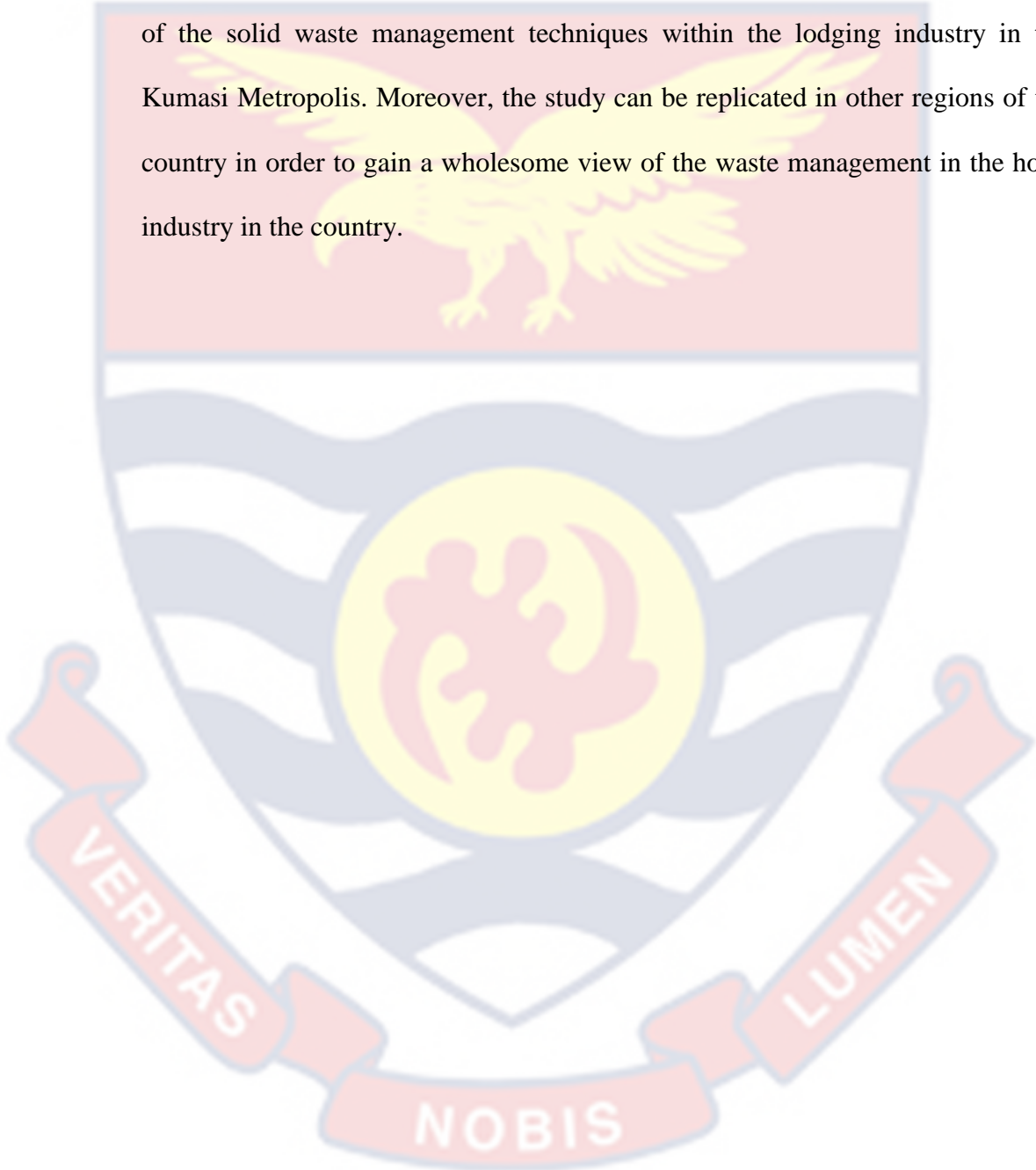
Recommendations

The recommendations of the study are based on the major findings and the conclusions. They are aimed to improve solid waste management in the hotels in the Kumasi Metropolis. The hotel managers are advised to:

1. Establish a working environmental policy to guide their solid waste management systems. This can guide the solid waste audit which will inform managers on the types of practices to use. The policy can also help in role assignment of staff and allocation of specific waste management duties to help with the staffing problem for waste management.
2. Find suitable avenues for recycling their paper wastes, as burning of wastes is generally not acceptable around the globe. Avenues for composting or re-using organic waste, such as selling them off to farms, can be sought by the various management bodies, instead of disposing them off.
3. Create awareness on the importance of solid waste management to business growth to the shareholders of the hotels, namely shareholders, management, employees and clients. This can help them to gain access to funds for management of solid waste.
4. Advocate for collaboration between the environmental protection and hotels in their efforts to manage wastes, by strengthening regulations and institutional setups.

Suggestions for further studies

The study covered only star rated hotels. However, the scope can be expanded to cover motels and guest houses in order to gain a comprehensive view of the solid waste management techniques within the lodging industry in the Kumasi Metropolis. Moreover, the study can be replicated in other regions of the country in order to gain a wholesome view of the waste management in the hotel industry in the country.



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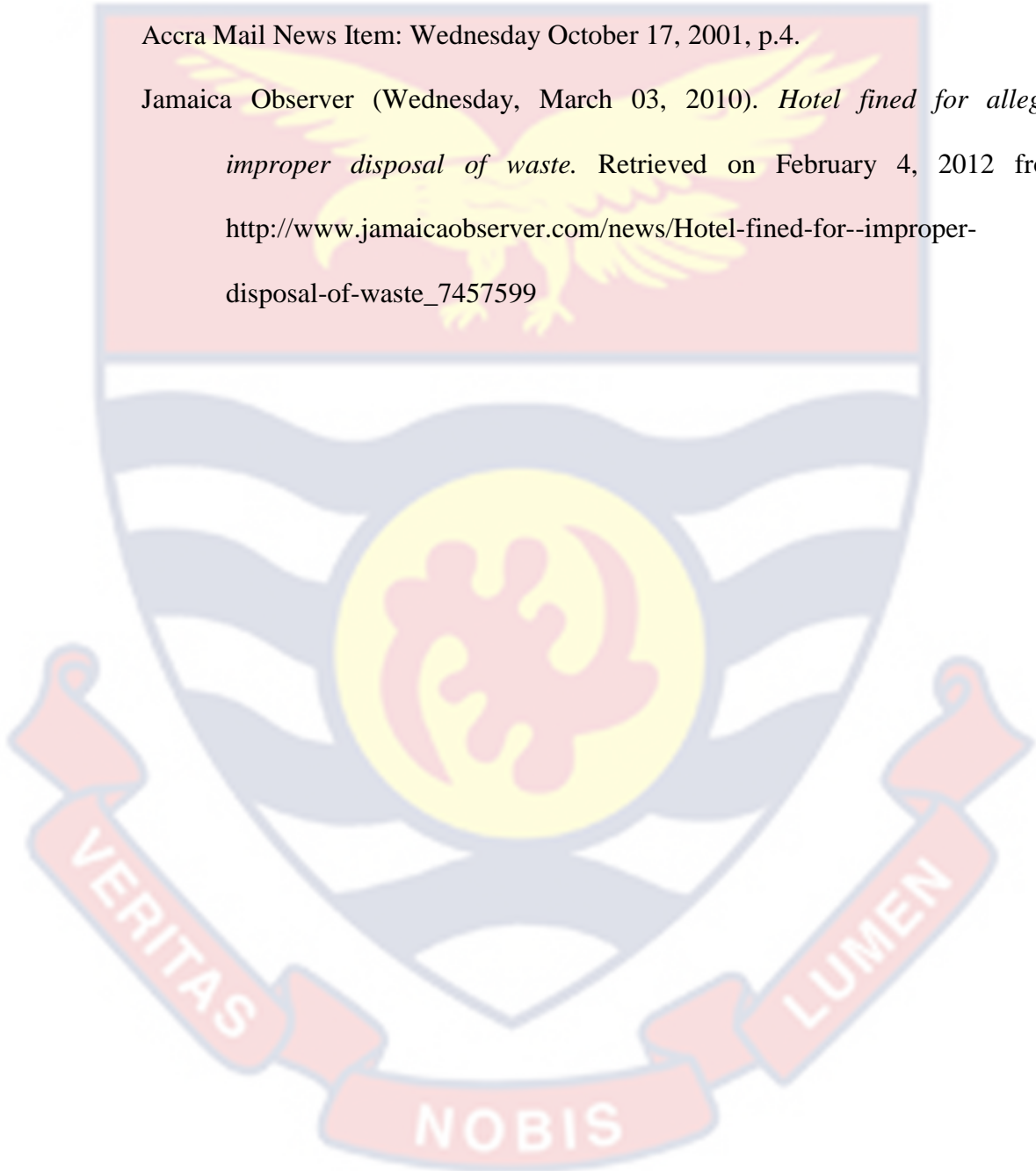
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APPENDIX 1

QUESTIONNAIRE FOR HOTEL MANAGERS

Dear Sir/Madam

I am an M.A Environmental Management and Policy student from the Institute for Development Studies (UCC). This is an academic study dubbed: Solid waste Management among hotels in Kumasi metropolis. The quest for information is principally for academic purposes. Responses provided shall be treated confidentially and uniquely for the stated purpose. Please be candid in expressing your opinions closest to the way you feel about an issue.

Thank you for your time

Section A: Hotel profile

1. Indicate the rating for this hotel
 - a. 1-star
 - b. 2-star
 - c.3-star
 - d.4-star
2. Year established.....
3. Location.....
4. Number of rooms.....
5. Average number of guests per year.....
6. Number of employees.....
7. Types of services offered
 - a. Food and beverage
 - b. Conferencing
 - c. Housekeeping/laundry
 - d. Other (specify).....
8. Number of departments.....

Section B: Composition of solid waste generated by hotels in the metropolis

9. Indicate the types of solid waste your hotel often produces by ticking against the list below:

Solid waste	
Paper	
Plastic and rubber	
Organic	
Glass and ceramic	
Wood	
Textile	
Ferrous metal	
Aluminium	

10. Using a scale of 1 to 8 where 1 = lowest and 8 = highest, arrange from the list below from highest to lowest, with respect to their volumes of production per day.

Solid waste	
Paper	
Plastic and rubber	
Organic	
Glass and ceramic	
Wood	
Textile	
Ferrous metal	
Aluminium	

11. Which department in your hotel produces the most solid waste?
12. What is the regular type of solid waste the department generates?
13. Would you agree that some of the solid waste generated by the hotel is hazardous?
- a. Yes b. No

Section C: Strategies hotels used in managing solid waste

14. Do you have an environmental policy that guides your waste management methods?

- a. Yes b. No

15. If yes, which organisational body is responsible for designing environmental policies?

- a. EPA
b. Shareholders
c. Hotel Management
d. Other specify

16. Which other stakeholders are involved in the planning of environmental policies?

- a. Departmental staff
b. Guests
c. Local people & General populace
d. Other, specify

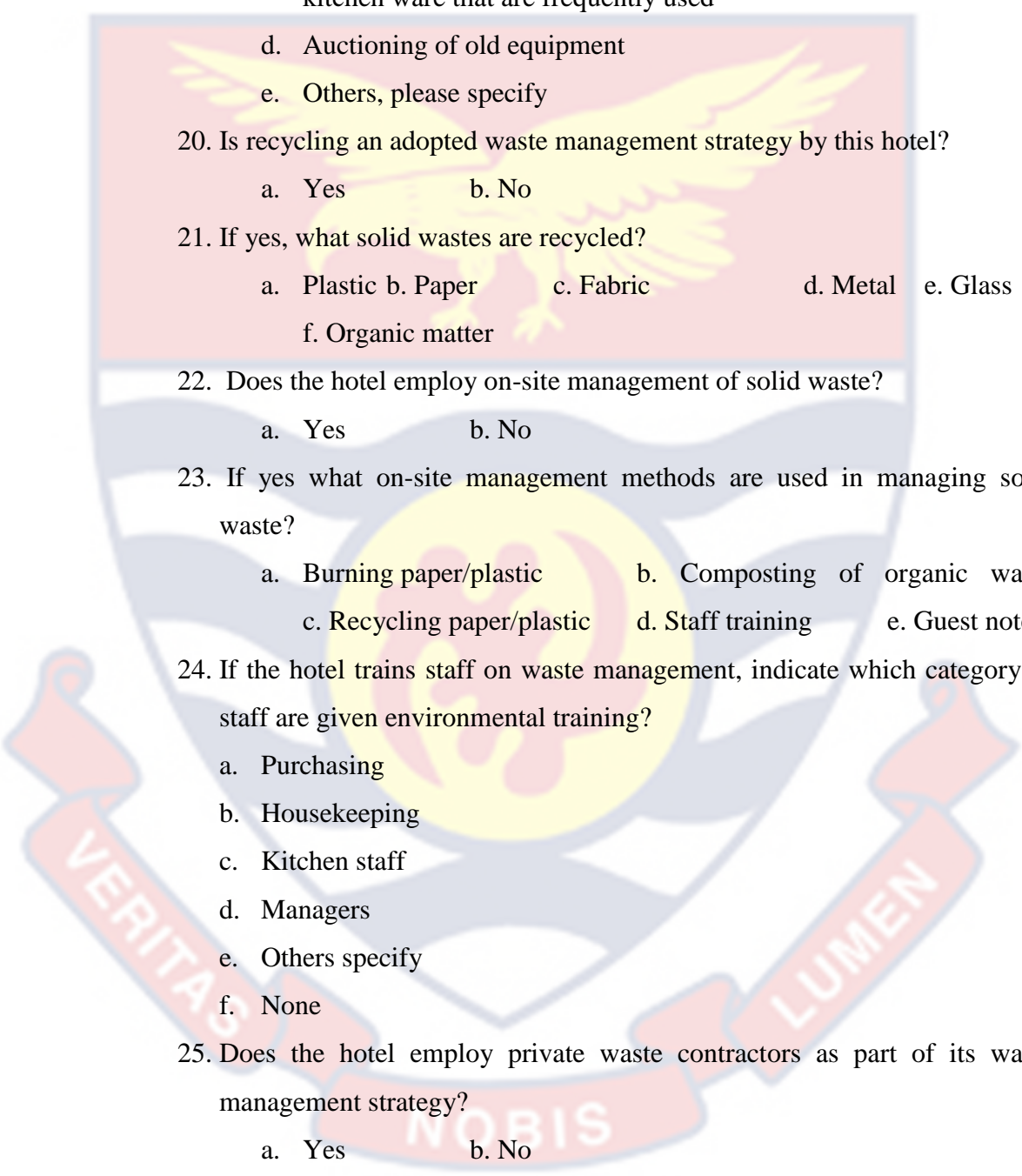
17. Which group of people are environmental policies communicated to?

- a. EPA
b. Shareholders
c. Hotel's management
d. Departmental staff
e. Guests
f. Local people & General populace

18. To what extent does the hotel make efforts to prevent waste generation?

- a. Very high
b. Fairly high
c. Fairly low
d. Very low
e. No effort

19. What specific techniques are employed by the hotel to prevent waste generation?

- 
- a. Buy-less-use-less approach
- b. Using recyclable materials
- c. Re-using gadgets, tools, and materials, such as bathroom and kitchen ware that are frequently used
- d. Auctioning of old equipment
- e. Others, please specify
20. Is recycling an adopted waste management strategy by this hotel?
- a. Yes b. No
21. If yes, what solid wastes are recycled?
- a. Plastic b. Paper c. Fabric d. Metal e. Glass
- f. Organic matter
22. Does the hotel employ on-site management of solid waste?
- a. Yes b. No
23. If yes what on-site management methods are used in managing solid waste?
- a. Burning paper/plastic b. Composting of organic waste
- c. Recycling paper/plastic d. Staff training e. Guest notes
24. If the hotel trains staff on waste management, indicate which category of staff are given environmental training?
- a. Purchasing
- b. Housekeeping
- c. Kitchen staff
- d. Managers
- e. Others specify
- f. None
25. Does the hotel employ private waste contractors as part of its waste management strategy?
- a. Yes b. No
26. If yes indicate the type of contractors employed?
- a. Waste haulers b. Waste recyclers c. Scavengers

Section D: Challenges hotels face in managing solid waste

27. What challenges do this facility face in its solid waste management efforts?

- a. Non-cooperation of stakeholders
- b. High Costs
- c. Inadequate staffing needs
- d. Others specify

Indicate the extent to which these factors cause problems in managing solid waste in this hotel using the key below:

0= no problem; 1 = Not so serious; 2 = Serious; 3 = Very serious

Problem	0	1	2	3
Inadequate of financial resources for waste management				
Inadequate of trained personnel on waste management				
No proper institutional set-up for solid waste management service				
Lack of waste management equipment				
Weak regulations				
Weak of enforcement measure and capability				
Low guest cooperation				

What recommendations would you make to address these challenges?

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Thank you