UNIVERSITY OF EDUCATION, WINNEBA

EXAMINING SOLID WASTE MANAGEMENT PRACTICES IN FOOD SERVICE SECTOR OF GHANA: A CASE STUDY OF SUNYANI MUNICIPALITY

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(200026421)

A Thesis in the Department of HOSPITALITY AND TOURISM EDUCATION, Faculty of VOCATIONAL EDUCATION, submitted to the School of Graduate Studies, University of Education, Winneba, in partial fulfillment of the requirements for the award of the Master of Philosophy (Catering and Hospitality) degree.

DECEMBER, 2020

DECLARATION

STUDENT'S DECLARATION

I, **Comfort Gyeduaah**, hereby declare that this thesis with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is entirely my own original research and has not been submitted, either in parts or in whole for another degree in this University or elsewhere.

SIGNATURE: ……..

DATE: …….....……

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: **DR. (MRS.) DOREEN DEDO ADI**

SIGNATURE: ……..

DATE: …….....……

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DEDICATION

To God Almighty and to my father, Joffie Adjei Amponsah

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ABSTRACT

This study examined solid waste management practices in food service industry of restaurants in the Sunyani Municipality of Ghana. Descriptive research design was adopted for the study. Using the convenience sampling, procedures, 331 respondents comprising of 86 managers and 245 employees were involved in the study. Two sets of questionnaires (for managers and employees) and an observation checklist were the instruments used in collecting data for the study. The data were analyzed through the computation of frequencies, percentages, as well as means and standard deviations. The study found out that, rubbish, food waste, and trash were the forms of solid wastes that were generated in the food service industry of restaurants. Again, it was observed that, 2200 kg of metals was generated in a weekly basis, and this was followed by glass with 2140 kg, plastic 2089 kg, food items 2029 kg and papers 1527 kg as the various types of solid waste that are generated from the selected food service industries of restaurants. Also, it was realized that, both staff and managers in the food service industry of restaurants were ready to reduce solid waste to a very high extent but were not ready to reuse, and recycle solid waste. Again, a number of the waste management strategic action plan for sustainable development of restaurants were identified. The strategies were that, management in the food service industry of restaurants and restaurant should provide funding needed for appropriate solid waste management practices and regular monitoring system should be in place to ensure that employees adhere to the solid waste management practices. The study recommended that the Environmental Protection Agency (EPA), the National Tourism Board and the Assembly should ensure that, the food service industry of restaurants provide separate bins to sort out the types of solid waste (e.g., glass, paper, plastic, and metals). This would help manage solid waste generation as solid waste can be reduced and recycled as much as possible. Also, the Environmental Protection Agency (EPA) and the Assembly should organize education/training programmes on solid waste management for managers and employees of restaurants on the need to reduce, reuse and recycle solid waste so that they can appreciate the need for sustainable development practices.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Solid waste is any substance or material which has no value to people who possess it and is discarded as a result of industrial, commercial and domestic uses and applications (Denison & Ruston, 2010). Waste disposal was not difficult in the early days, as human settlements were sparse and land was abundantly available. With the emerging increase in towns and cities where significant amounts of people began to assemble in relatively small areas in search of livelihoods, waste disposal becoming problematic (Shafiul & Mansoor, 2003). Although population in urban places and per capita waste production increased, the amount of land available for disposal declined proportionately. Solid waste management has thus emerged as a critical, specialist sector for keeping communities and organisations safe and viable.

The management of solid waste relates to the isolation, recycling, processing, transport and ultimate treatment of waste in an environmentally friendly way. In spite of this, management of solid waste is an essential public health service and an indispensable part of critical community services. This may be due to inadequate waste disposal, which will have harmful effects on the wellbeing of individuals who are subjected to these unsanitary practices. Illnesses such as typhoid, diarrhea and cholera are all attributed to inadequate waste management activities (Chen, 2015). This will result in the lack of human capital required for the socio-economic growth of the nation.

Technological and economic developments have rendered the sources and types of solid waste very varied, and the issue of waste management more complicated to contend. Moreover, N.E.H.A (2005) attributed that weak infrastructural framework and limited capacity and limited resources; both capital and human in nature have placed

sanitation and waste management conditions in many developing world cities, especially in Africa, in a rather deplorable state. For example, the high market for plastics and/or rubber goods, which are largely non-biodegradable, has an adverse effect on the climate and that such waste may be recycled. However, lack of awareness on the environmental effects of such practices and lack of ability to pay for solid waste management (SWM) remain factors that render recycling a significant obstacle to resolve. Waste, particularly solid waste, is progressively becoming such a challenge to modern society (Caboni & Giudici, 2012).

The World Economic Forum (2016) study estimates that 32% of industrial waste, of which 40% is disposable packaging, does not enter or escape waste mobilization facilities (UNEP & GRID 2016; WEF 2016). The example of South Africa is that approximately 56% of waste is unregulated, does not fall into organized recycling networks (Jambeck et al. 2015) and ultimately ends up on the beaches and in the sea, where it breaks down to form tiny bits of microplastics swallowed by aquatic organisms. Prevalent global methods of production and usage, as well as waste management processes, push the amount of plastic waste (Chen, 2015). In South Africa, as in other African nations, there is a high degree of non-compliance with many waste dumps or open and unregulated landfill sites. Wind and water-borne waste can pollute the soil and water habitats.

The effect of inadequate solid waste management on the hospitality sector raises major economic and environmental costs as it decreases the efficiency and functionality of essential natural systems and closes urban facilities (inland wetlands and wastewater outflows) (Jambeck et al. 2015). For e.g., the 2009 study reports that beaches contribute R2 billion a year to the South African tourism sector and that R10 million is spent on beach cleaning a year (Ryan, 2009). There are no more current figures that see why the

importance of the beaches and the expense of cleaning them has risen. There are no further recent estimates to indicate why the value of the beaches and the cost of cleaning them have increased. The effects of insufficient solid waste management on the hospitality industry increases substantial economic and environmental costs as it limits the quality and functionality of critical natural systems and closes urban facilities (inland wetlands and wastewater outflows) (Jambeck et al. 2015). Small Restaurants have an adverse impact on the environment. Small restaurants contribute to a growing volume of solid waste generation and disposal (McIntosh, 2014). In order to incorporate the reuse, decrease, and recycle strategy, it is important for managers to introduce a recycling scheme in their organization (Heung & Pun, 2013; Sloan et al., 2013).

It has also become increasingly clear that customers have become conscious of environmental problems that are caused by the activities of the Restaurants industry and therefore seek the services of eco-friendly restaurants (Han, Hsu & Sheu, 2010). The Restaurants industry is striving to provide quality service, which is essential for customers as the quality of service is an antecedent of customer satisfaction (Caruana, 2002; Han & Ryu, 2009). Quality of service is a judgement made by a customer. It is perceived as the outcome of an encounter between the person providing the service and the receiver of the service, after which the customer would make an evaluation of the quality received to ascertain whether he or she had satisfaction or dissatisfaction (Bitner, Booms & Tetreault, 1990; Cronin, Brady & Hult, 2000).

Service quality is therefore essential for companies trying to satisfy their customers as, it costs more to attract new customers than to maintain the existing ones (Fornell, 1992). Solid waste management practices in the Restaurants industry could be seen as an opportunity and a good marketing strategy that can yield a competitive advantage for restaurants (Manaktola & Jauhari, 2007) especially when it positively

impacts on customer satisfaction and Restaurants sustainability. These issues led to the identification and formulation of the problem statement for this research.

1.2 Statement of the Problem

Recently, solid waste has become one of the major issues in Ghana Sunyani inclusive. This is because huge tons of waste are generated in various industries and homes. The food service industry is known as "the silent destroyer of the environment" (Punitha, Aziz & Rahman, 2016). This is because most of their activities generate large volumes of waste which harm the environment in the long run. All these solid waste generated by restaurants can have economic, health and environmental impact if not well managed.

Restaurants in Sunyani Municipality do not have waste recycling management systems in place. They do not sort out solid wastes, neither do they recycle nor reuse these solid wastes. Some other restaurants resort to the burning of solid waste and dumping of waste at unauthorised refuse sites. Worst still, because most of the restaurants leave their waste unattended, it is not uncommon to see dogs, cats and other animals spread these wastes which do not make the environment and restaurant attractive, not to even mention these wastes choking the gutters. According to Tchobanoglous et al., 2003 solid waste if left unmanaged tend to become breeding grounds for insects and vermin such as cockroaches, mosquitos, ants, houseflies, rats and mice among others. This may result in economic health and environmental hazards.

Lack of appropriate solid waste management can be linked to poor environmental sanitation which can also lead to health problems such malaria, diarrhea, typhoid fever. This can affect the health of management, staff, guest who patronize the facility the community in which they operate and the country as a whole.

Again, solid waste if not well managed can produce an eminent odour which may lead to the creation of environmental pollution. All these have negative economic impact because healthy people produces healthy economy. Hence, there is an earnest need for waste management practices to help manage environmental issues and ensure sustainability.

1.3 Objective of the Study

The main objective of the study is to examine solid waste management practices in the foodservice sector in Sunyani Municipality.

1.3.1 Specific Objectives of the Study

The following specific objectives guided the study:

1. To classify the solid waste generated in the food service sector (Restaurant) of Sunyani.
2. To determine the level of readiness of the restaurant to reduce, reuse and recycle solid waste in the Sunyani Municipality.
3. To examine waste management strategic action plan for sustainable waste management practices in the restaurant of Sunyani Municipality.
4. To evaluate the effectiveness of environmental management policies and practices of solid waste management of restaurant in Sunyani Municipality.

1.4 Research Questions

The study was guided by the following research questions:

1. What categories of solid wastes are generated by food service sector in the Sunyani Municipality?

2. What is the level of readiness of the restaurant to reduce, reuse and recycle solid waste of restaurant in the Sunyani Municipality?
3. What waste management strategic action plan can be proposed for sustainable waste management practices of restaurant in the Sunyani Municipality?
4. What is the effectiveness of the environmental management policies and practices of solid waste management of restaurant in the Sunyani Municipality?

1.5 Significance of the Study

The management of solid waste has recently become a big concern for administrators, personnel, organisations and consumers. This deserves the attention not only of the Municipal Assembly and the institutions for waste management but also of corporate organisations and individuals to find a lasting solution to the problem. Through inadequate waste management, valuable human capital could be wasted, and this will impact competitiveness in the Sunyani Municipality. Therefore, the study seeks to explore appropriate methods and suggestions for the safe and effective management of solid waste in all areas of the municipality.

Given the enormity of the crisis, the municipality conducted relatively little research on solid waste management. The report would be a focal point for SDM and waste control organisations for the Local Assembly. It will provide us with an in-depth understanding of what the issues of solid waste management are and the answers to the problems. The report would also contribute to established solid waste management literature and promote more studies on this issue in other metropolitan areas and municipalities.

1.6 Delimitation of the Study

Restaurants in the Sunyani Metropolis served as the geographic scope for the study. The study aimed at exploring solid waste management practices in the foodservice industry of restaurants in Sunyani Municipality. The study sought to classify the solid waste generated by restaurants; determine the level of readiness of restaurants to reuse, reduce and recycle solid waste; examine waste management strategic action plan for sustainable development of restaurants; and evaluate the effectiveness of environmental management policies and practices of solid waste management in restaurants. The stakeholder theory, strategic choice theory, and environmentally responsible behaviour (ERB) constituted the theoretical bases for the study.

1.7 Limitations of the Study

Every study is bound to be faced with imposed restrictions, and this study will be no exception. First and foremost, this study adopted the questionnaire and challenges emanated from this source. Some of the items were not answered, and even some of the questionnaires were not returned. Also, the questionnaire limited the responses that respondents provided compared with that of an interview, which is more flexible. Again, some of the respondents were reluctant to involve themselves in the study. However, the researcher assured them of their confidentiality and anonymity. Despite these challenges, it is hoped that the results that were obtained can be generalised.

1.8 Organization of the Study

The study is organized into five chapters. Chapter one introduces the study whereas chapter two presents an in-depth review of relevant literature. The methodology is discussed at length in Chapter Three. The findings are the focus of Chapter Four. In relation to the research questions stated in the study, the implications of the results are discussed. A summary of the results of the research and conclusions is presented in Chapter Five, the final chapter.

CHAPTER TWO

LITERATURE REVIEW

This chapter considered the theoretical and conceptual components of research related to the study. Works were reviewed from secondary sources such as the internet, journals and other related research works. Theoretically, the stakeholder theory, strategic choice theory, as well as environmentally responsible behaviour (ERB) constituted the theoretical bases for the study. In addition, the description of waste and solid waste, forms of solid waste, the philosophy of solid waste management, solid waste management methods, solid waste management practices, early waste management practices, new approaches to solid waste management, environmental sustainability policies and procedures, concerns relating to solid waste management, impacts, etc. The chapter ends with a rundown of the literature analysis.

2.1 Theoretical Review

2.1.1 The Stakeholder Theory

In the mid-1980s, the stakeholder theory emerged and gained prominence, notably in Freeman's works in 1984. He suggested that his interpretation of the definition of stakeholders was based on an organisational viewpoint. From management practice, the pre-and post-Freeman (1984) stakeholder approach grew. Freeman (1984) further suggests that the idea of stakeholders or stakeholder approaches to strategic management means that managers must formulate and enforce procedures that please those and only such people that have a stake in the company. This process focuses on managing and integrating the relationships and wishes of owners, staff, consumers, vendors, societies and other groups in a manner that ensures long-term survival of the business (Freeman, 1984).

The stakeholder approach is said to have been carried out by the managers of the company. However, managers should be able to control the company for the good of its stakeholders in order to ensure their rights and involvement in decision-making. Again, management must serve as the shareholder agent to ensure the survival of the company as well as the long-term interests of each party (Freeman, 1984). In other words, when a company succeeds, it depends on the degree to which managers involve stakeholders in decision-making. Firms do not really function on their own to make money for their shareholder, but they also rely on other entities that have an interest in the company. As a result, the survival of an organisation depends primarily on satisfying the diverse needs of stakeholders.

Overall, the stakeholder theory is the understanding that an organization is a system with separate components with diverse goals in terms of what the organisation should be and how it should work. Friedman & Miles (2006) argued that the organisation should be conceptualised as a grouping of stakeholders and that the objective of the organisation should be guided towards the management of the needs, wishes and points of view. The various constituents of the organisation are stakeholders, such as shareholders, suppliers, customers, employees, local communities, the government and the general public. Stakeholders need to be well controlled to maintain their interest and involvement in the company in order to ensure the sustainability and sustained viability of the business (Clarkson, 1995).

This concept suggests that organisations are in constant contact with their stakeholders and that the effectiveness of organisations depends to a large degree on their ability to establish trustful and mutually respectful relationships with the different stakeholders (Kunetsov, Kuznetsova & Warren, 2009). The Stakeholder Theory also holds that companies should be viewed as structures whose business relies on their

ability to please a certain group of stakeholders known as stakeholders who can recognise their rights, ownership, or interests in, past, current, or potential business and activities (Blomback & Wigren, 2009).

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Waste management problems are seen as part of the broader corporate social responsibility and are better discussed in the theory of stakeholders (Crespedes, 2003). Gurumurthy (2011) proposed that stakeholder's control and implement regulatory, economic and social licensing conditions to exploit a range of licensing terms. This suggests that the efficiency of waste management companies is determined by the regulatory, social and economic licenses issued. The consequence of the stakeholder principle in this study is that restaurants can place additional emphasis on the dimensions of waste management and Restaurants efficiency in the examination of stakeholder interests, as the interests of the company can be nurtured by interactive symmetrical two-way contact with stakeholders (Madsen & Uihoi, 2001). Restaurants need to consult on an ongoing basis with all partners on waste prevention initiatives that have been placed in motion in a work-friendly operational setting.

The stakeholder theory is taken as a conceptual basis for this study because, over the last few decades, the stakeholder approach has developed into one of the largest areas of waste management. Restaurants in the Sunyani Municipality run not only to make money for their owners but also to other groups who have an interest in the business. It is critical that Restaurants and restaurant managers in the Sunyani Municipality engage their stakeholders (customers, vendors, staff, local communities, government and the general public) on a continuous basis in matters relating to solid waste management, as these stakeholders would be impacted by the effect of sound or inappropriate methods of handling solid waste. For restaurants to thrive, much depends on the degree to which management involve stakeholders in decision-making. Thus, the sustainability of restaurants relies primarily on satisfying the complex needs of the stakeholders.

2.1.2 Strategic Choice Theory

Strategic Choice Theory was initially formulated to resolve the limitations of the classical contingency theory (Child, 1972). Strategic Choice Theory is based on the premise that a firm is capable of achieving high operational productivity and success by proper execution of strategies in an acceptable context (Wagner & Bode, 2008). Strategic Choice Theory (Child, 1972) offers a basis for implementing constructive policies to solve important concerns such as environmental protection (e.g. greening practices). The theory argues that companies take a strategic approach, especially when addressing issues beyond the company (Child, 1972, 1997). In addition, ideally, companies have the option to develop and execute plans, in particular, to resolve environmental problems that, in fact, help to achieve successful or desirable company objectives.

Based on the Strategic Choice Principle, both the world and the system have the meanings and actions of people. Theoretically, firm managers are considered to play a constructive role in making their decisions individually while serving as energising factors that form the organisational world (Astley & Van de Ven, 1983). As a consequence, in the light of sustainable sustainability, the Strategic Preference Principle suggests that a positive approach from upper management results in a high degree of dedication to solid waste management and partnership orientation over time. The key aspect, however, to be understood on the basis of the Strategic Option Principle, is to convert management expectations into the strategic obligations that organisations and their staff must uphold in order to meet the apparent and evolving demands of stakeholders (Jørgensen & Jørgensen, 2009). In summary, constructive approaches to solid waste management problems allow businesses to address new business opportunities and, in turn, maintain a competitive edge (Andersson and Bateman, 2000; Sharma, 2000).

Under the SCT, Child (1972) believed that firms are free to select strategically from the choices available when designing a mechanism or system. In the other hand, strategic decision-makers encounter a degree of restriction on the basis of contextual considerations (Wagner & Bode 2008). From a strategic choice standpoint, aligning the company's finances with its corporate context can be seen as a key and essential challenge for strategic decision-makers. These decision-makers must constantly consider all possible environmental risks and opportunities as they determine the options, they have in order to make the most suitable and strategic option for an ever-changing world (Miles & Snow 1978, Venkatraman & Camillus 1984).

There is also a need for organisations to rethink and realign themselves in response to problems that they would like to resolve on the basis of the strategic choice principle (Ketchen & Hult 2007). This will allow restaurants to enhance their adaptability to the demands of the operational climate, as seen in the orientation of the tactics they adopt called the strategic orientation (Ponomarov, 2012).

2.1.3 Hines Environmentally Responsible Behaviour (ERB) Theory

In 1987, some scholars which included researchers the like of Hines published a meta-analysis of behavioral science literature (Hungerford & Volk, 1990, p.9). After analyzing 128 studies, the scholars evaluated variables in association with responsible environmental behaviour. The outcome of this analysis is the model of responsible environmental behaviour. According to them, an individual's desire to act is inclined by a multitude of personality characteristics such as the person's attitude towards the environment or workplace, locus of control and attitudes toward taking action and situational factors (Adams, 2003).

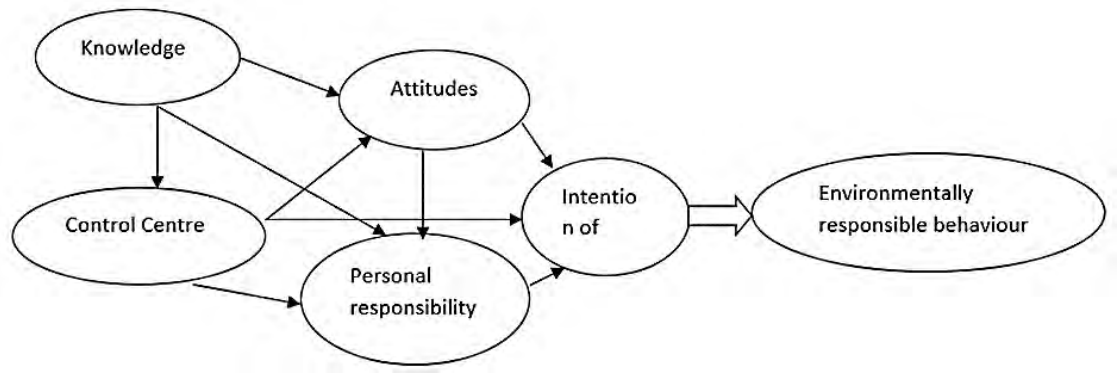

Figure 2.1: Theory of Environmentally Responsible Behaviour
Source: (Hines et al. as cited in Pan et al., 2018)

Hines et al. (1987) The theory of Responsible Environmental Behaviour demonstrates that personal responsibility is a personality factor that affects behavioural intentions and environmentally responsible behaviour (Hines et al., 1986, quoted in Pan

et al., 2018). Researchers are also interested in understanding the variables that predict the duty of individuals to protect the environment (Pan et al., 2018).

The locus of influence on which Fishbein et al. (1967) are silent was conceived as a person's understanding of their capacity to effect real change by their actions (Newhouse, 1990). There are two primary components locus; an intrinsic and an extrinsic control locus. According to Hines and associates, it is extremely unlikely that anyone with an external management locus, for instance, will attempt to make a positive shift when such a person assigns change to luck or influential others, such as a monitoring and assessment team, core policymakers, clients who use the service, or occasionally, friends with whom the person works, etc. Conversely, a person with an internal control locus, for instance, may be more likely to become directly interested in supporting green practices in the hospitality industry, as he or she might feel that his or her decisions will make a difference (Fiedeldey et al., 1998; Hungerford & Volk, 1990).

Situational factors, as could be seen from their conception, often represent these external factors which can conflict with the successful execution of duties. On the basis of this work, Kollmuss and Agyeman (2002) generalised this model of pro-environmental, stating that various variables affect individual decision-making and subsequent output or intervention (Pan et al., 2018). They observed that the factors that affect the actual behaviour of the individual are impacted by two main factors: internally and externally. While internal factors confirm what Fishbein and Ajzen (1967) came up with (e.g., environmental knowledge, values, behaviours and emotional commitment) in the theory of rational behaviour, external variables considered in this elaborate paradigm often take into account political, social, cultural and economic factors (Kollmuss & Agyeman, 2002, quoted in Pan et al., 2018). This is of special interest to this study, as it carries with it a macro viewpoint such as the availability of

supervisors, the effect of restaurants administration and legislation on the preservation of green practices in restaurants.

While this theory, as mentioned above, offers a more extensive viewpoint for this analysis, there are some shortfalls. According to Kuhlemeier, Van den Berg and Lagerweij (1999), the fundamental premise of the Environmentally Friendly Behavior Hypothesis (ERB) was that people who are knowledgeable about climate have positive attitudes towards the environment, but numerous findings have debunked this assumption. In the United States, for example, amid the increasing concern among people for the protection of the atmosphere, few have embraced a more environmentally friendly lifestyle, according to studies by Dunlap (1991) cited in (Scott & Willits, 1994). This result seems to be apparent in several nations. For example, it is easier for people to embrace attempts to enhance environmental hygiene, but in fact, only a few actively alter their behaviour. For instance, it is not common to see people defect along river bodies and refuse dump sites in most developed countries as well as lead to inefficient disposal of waste by pollution of all ways.

In the face of scepticism aimed towards this concept, the environmentally responsible actions in the community serve as an elaborate insight in which human behaviours and behavioural motives can be assessed against control and structural systems. For example, the preservation of sanitation in restaurants, among other things, may rely on the existence of waste bins that are normally collected and emptied such that individuals who work in the kitchen, for example, may still have a place to dump waste at any time they need it. Thus, while it is the duty of the mangers to supply the refuse or the dust bins, it becomes the joint responsibility of the staff to refuse the bins properly.

In brief, if restaurants managers and employees have higher intentions for an environmental activity or well-developed pro-environmental actions, they are more likely to engage in such behaviours in their day-to-day management of the restaurants and thereby encourage others (workers and other management staff) to do the same relative to environmental awareness that may not support green activities in the restaurants. Once adhered to, the former could theoretically lead to repeated hospitality efficiency, which could also encourage green practices and thereby decrease grievances, reduce costs, improve productivity and increase sales. The value-belief-norm theory of the world is a related and more recent theory for interpreting human actions and environmental attitudes.

In waste management systems, no one body is responsible for existing activities or necessary to trigger behavioural changes or induce behavioural changes. For example, in major cities such as Ibadan, Port Harcourt, Jos, etc., people pile up their waste materials in the middle of the streets, despite laws by waste management authorities barring such actions. Many of these blunders do it at unusual moments where law enforcement authorities are not eligible, some are influenced to dump those waste materials indiscriminately when they see others doing so, and others also find ways to dump their waste materials decently.

Under the model, information alone is grossly insufficient to behave responsibly against the world, while the awareness of some persons about the environment and its rules, which lead them to a positive mentality that may lead to good intentions to act, can give rise to internal and external influence, such as being influenced by the activities of others or being strong. While separate behavioral frameworks, control centers and the intention to act are not adequate to determine an intention to act, united by a single

central concept, they become the basis on which predispositions for environmental actions are formed.

2.2 Conceptual Review

2.2.1 The Concept of Waste

Waste is more readily detected than described. Primary concerns in the definition of waste are unused or discarded resources, which have environmental health effects. Gourlay (1992) quoted in Freduah (2014) states that anything will become a loss if this is no longer important to the owner. Read (2009) defines waste as any product that comprises scrap or effluent material or other discarded surplus substances arising from the execution of the procedure, or any substance or article that is intended to be disposed of as faulty, worn out, tainted or otherwise destroyed. Waste can be liquid, gaseous or solid.

Under the European Environmental Protection Act (1990), waste is to be disposed of as lost, worn out, polluted or otherwise harmed by any product this constitutes waste material or any effluent or other discarded surplus product arising from the implementation of the operation, or any object or article intended to be disposed of. A more detailed definition of the word waste is set out by Gilpin (2016). According to him, the concept of waste is defined as any by-product or residue discarded and commercially unusable at any given location and time and any other matter which may be disposed of accidentally or otherwise in the environment. Palmer (2018) argues that if the user does not want to take any further responsibility for it, an item becomes a loss.

Palmer (2018) even farther, indicates that any substance without the owner is waste. Gilpin (2016). It also indicates that waste must occur in a quantity, composition, electoral district or manner that causes significant environmental change. Davies (2008) describes waste as discarded or impractical material that originates from a wide variety of industrial and agricultural sources, from industries and domestic, which can take the form of solid or gasses, liquid in nature, and whether potentially dangerous or non-hazardous depending on location and concentration. As a consequence, in addition to waste being an unnecessary product that is recycled, its effect on the environment as well as on health risks should be taken into account in the definition of waste.

UN Statistical Division (2015), maintains that waste is a commodity that is not a prime good (i.e., a product manufactured for the market) for which the generator has no other need for its own form of processing, conversion or consumption, and which it wishes to dispose of (UNEP). Waste is categorized in terms such as agricultural waste, domestic waste, urban waste and liquid waste. Household waste is waste produced by domestic output and consumption practices. Household waste is urban waste. Municipal solid waste (MSW) is a term widely used for heterogeneous accumulation of waste generated in urban areas, the type of which varies from region to region (UNEP, 2015).

Tsiboe & Marbell (2014) suggest that waste of either shape or classification – concrete, liquid or poisonous – has become a significant consequence of modernisation and economic growth. Westernisation and the western lifestyle did not provide a budget for issues relating to waste management in general. For the purposes of this report, my attention is on solid waste, and this will be explored vividly in the next section of the review.

2.2.2 The Concept of Solid Waste

The concept understudy has various definitions for various authors. The United States Environmental Protection Agency (US EPA, 2008) defines it as something consisting of garbage and debris that typically originates in a private residence or apartment building.

In the "Environmental Sanitation Strategy" document (1999), the EPA argued that solid waste comprises all solid waste materials created by homes, organizations, commercial institutions and factories and all hidden piles of such waste; street sweeping, dead animals waste disposal, construction/demolition waste, and others. Due to their inherent contamination risks, hazardous waste products need stringent and cautious means of disposal (DELM, 2013).

According to Tchobanoglous, Theisen & Vigil (2013), solid waste is any material arising from human and animal operations that are usually discarded as unnecessary or rejected. Zerbock (2013) describes solid waste to include domestic waste, agricultural waste, non-hazardous waste, household administrative waste, hospital waste and building waste. Solid waste is a substance of less liquid content, distinguished by a reactive and fragile disposition when subjected to sunlight, some of which have acids or bases that can corrode metal containers (OECD, 2005). Any solid waste is poisonous and hazardous when swallowed or absorbed. Any can also cause fire and explosion if located under such circumstances (Alam & Ahmade, 2013).

The United Nations Environmental Program study states that the composition of waste varies around and within countries due to population size, urbanisation and affluence (UNEP, 2010). The Oteng-Ababio (2011) research on governance problem and behaviour change considers the composition of solid waste as a component. The components are organic (food particles), paper, textiles, metal, plastics, glass etc. In

this report, a significant feature of solid waste involved the changing complexity of the waste stream was identified. Organic matter forms a large part of the waste stream relative to other countries with a special focus on London. The huge amount of food particles that go to landfills makes a big contribution to global greenhouse gas pollution. In the last few decades, there has also been a gradual rise in the use of plastic goods, resulting in a proportionate increase in plastic waste in municipal solid waste streams around the nation (Fobil & Hogarh, 1012). These elements, like the others, have immense environmental consequences when left uncollected.

The solid waste composition varies from place to place. The average level of revenue, sources, population, social activity, environment, industrial production and the demand for waste materials are factors affecting the composition (Yadav & Devi, 2009). Babayemi & Dauda (2009) views solid waste as non-liquid and non-gas results of practices deemed to be unsuccessful. This may take the form of rejection, sludge and garbage. Both domestic waste and non-hazardous waste, including commercial and industrial waste, street cleaning and construction debris, as well as human waste, has also been described as solid waste (UNEP, 2009).

Based on the above scholarly terminology, any material (solid, liquid, gaseous and radioactive) that is dumped into the atmosphere because it is no longer used and has a negative effect on the environment is the concept of waste to be used in this review. Therefore, by operationalising the term, solid waste may be said to be any substance that comes from commercial and industrial sources resulting from human activities. The next segment will look at the forms and sources of solid waste from the above review.

2.2.3 Sources and Classification of Solid Waste

A more suitable waste management practice is driven by the classification of solid waste. The classification of solid waste as a source is based on the assumption that waste originates from various industries, such as residential, commercial, open areas, agricultural operations, such as the sale of agricultural goods, and industrial sources. An Asian study defined the waste sources as commercial, residential, manufacturing, municipal facilities, construction and demolition, refining and agricultural sources, the World Bank (1999) provided a clear example of the source classification. The types of solid waste are described by Brennan & Withgott (2015) as "municipal solid waste, industrial solid waste, hazardous solid waste and wastewater."

They added that waste generation can degrade the quality of the water, soil quality and air quality, and can thus affect human health while causing ecological damage. The forms of solid waste which are rubbish, ashes, food waste, residue and special waste have been introduced and clarified by Tchobanoglous et al., (2013). Street waste, dead animals and abandoned cars, roadside refuse, urban container litter and bin debris are included in the special waste. In relation to the origins, processing facilities and processes as Tchobanoglous et al. (2013) identify solid waste types. He further clarified the categories of solid waste to be rubbish, food waste (garbage), paper of all kinds, the plastic of all kinds, ashes and residues, and other components of special waste.

Rubbish entails of solid waste from homes, institutions and commercial operations, both fuel and non-combustible. This includes food waste or other items which are extremely putrid. Materials like paper, cardboard and plastics are usually combustible rubbish. Glass, stainless steel containers, aluminum cans, iron metals and dirt compose of non-fuel waste (Tchobanoglous et al., 2013).

It is defined as any non-decayable substance that otherwise have been used to dispose of by minimal household repairs in a residential community, including brushes and waste. Inherently dangerous, toxic and harmful waste, which is also referred to as 'hazardous waste' by the State with the necessary authority, in addition to substantial liquid waste and any agricultural waste, blocks, stones, excavated earth, debris cement and waste generated by major destruction, installations and waste are specifically exempt from degrading.

Food waste is any food material that needs to be waste, disposed of, fresh or fried. Chemical residues produced by storage, selling, cleaning, cooking and serving are food waste (US EPA, 2010). Food waste in kitchens, restaurants and cafes includes unconsumed portions of food and food preparation activities (Miller, 2014). Food waste also acts as a food supply for certain animals, according to Kreith (2014). Food waste comprises waste from homes, commercial establishments (e.g., restaurants), organizations (e.g., colleges, hospitals), and some industrial sources (e.g., factory cafeterias or lunchrooms) for food and food storage.

This is alluded to as vegetative waste, which is created as a result of landscape growth and maintaining yards such as plant components such as brushes, tree members and leaves as well as vegetative material that has a C:N ratio above 75.

Combustion of urban waste causes another waste called ash, which may include some components initially found in the waste. Disposal of MSW ash needs less landfill space than unprocessing MSW reduced urban solid waste power stations.

However, as waste from domestic solid waste can comprise radioactive materials, waste from power plants must be regularly tested to ensure the waste is treated safely so that toxic contaminants do not move into groundwater sources (US EPA, 2012). In urban areas, burning is not recommended, since fly ash, poisonous

gasses or acid emissions in denser urban areas pose still more risk to health than in rural communities (EGSSAA, 2009).

This is made up of any material waste that either requires, permits or poses an uncommon danger to the health of human beings, services, property or the atmosphere. due to its physical features, chemical composition or biological nature (Miller, 2014).

Many classes of individuals are affected by toxic waste, endangering waste users, waste collectors, waste pickers, landfill workers and local residents. Deposit leachates may also be dangerous; their toxicity is commensurate with the number of hazardous materials combined with other solid waste. In Africa, toxic waste disposal needs urgent attention. This is extremely challenging due to the variety of products and suppliers, from residences to commercial and medical facilities (EGSSAA, 2009).

2.2.4 The Concept of Solid Waste Management

Several researchers have varying perceptions of solid waste management. Kumah (2007) describes proper waste management as waste generation management, waste separation, storage, transition, refining, treatment and disposal. But Tchobanoglous et al. provide a more comprehensive explanation of solid waste management (2013). They claim that solid waste management is conducted in compliance with best public health, recycling, design, esthetics and other environmental and public perceptions in order to track solid waste production, processing, storage, transport, recovery and disposal.

Related to all the solid waste management standards, this is an integrated method including the aggregation, isolation of origins, storage, transmission, distribution, sorting, handling and disposal of waste. Including all fiscal, administrative, planning, engineering and legal, functions. For example, Dhindaw (2014) and Puopiel

(2010) defined solid waste management as an area for the generation, storage, recycling, delivery, processing and recovery, and disposal of solid waste. They are carried out in a way consistent with public health, economics, conservation, aesthetics, infrastructure, urban and regional planning and other environmental factors which also influence public views. Zender (2010) has also described solid waste management as a management of waste production, source isolation, storage, distribution, transportation, collection, processing and disposal practices.

Solid waste disposal is an essential utility of the environmental and an integrated part of critical public services (Puopiel, 2010). This is because the health impacts of an inadequate waste treatment system can be very serious on people subject to these poor sanitation conditions. Bad practices contribute to Illnesses such as cholera, typhoid, dysentery and malaria (Puopiel, 2010).

Schübeler et al. (2016) offer a detailed overview of the management of solid waste that summarizes the above concepts. Solid waste management is a dynamic activity within its framework, which is as dependent on the organization and collaboration of various players in public and private sectors as it is on the necessary technological solutions. It encompasses all financial, administrative, planning legal and engineering roles that are involved in the whole range of solid waste problem. Complex interdisciplinary partnerships between different fields, such as economics, health science, planning, engineering and politics and geography, are often involved in the solutions (Schübeler et al., 2016). Therefore, the basic issues and ties involved must be well established and understood if solid waste management is to be efficiently and orderly (Tchobanoglous et al., 2013).

2.2.5 Solid Waste Management Practices in Restaurants

Solid waste is a key concern for stakeholders in the hospitality industry. Usually, restaurants guests produce kilograms of waste a day that accumulates thousands of tons of waste each year (IHEI, 2012). Most local Restaurants have no experience in waste prevention and/or recycling, claiming that this is too expensive and time-consuming (Chan & Lam, 2011). Cohen (2016) measured solid waste production from economic sources and found that the hospitality industry produced an average of 400-600kg of waste in a given day.

The costs of disposal incurred by a restaurants company, but other secret costs such as staff, resources and energy also contribute (Todd and Hawkins, 2017). In the United Kingdom, waste management is currently regulated and governed by the Environmental Protection Act (EPA) of 1990, which requires extra control of waste collectors and producers (Read, Phillips, & Robinson, 2018). Both waste suppliers shall comply with the "Duty of Care" Act. This allows both commercial and manufacturing businesses to properly store, transport and dispose of their waste (Webster, 2010).

The SWM hospitality model has been developed by Cummings (2017). The model comprises five stages in waste minimisation, including waste minimisation dedication, eco-intelligence purchase, productivity in waste processing, recycling and waste segregation. However, the Cummings model does not apply to restaurants who have a negative attitude towards sustainable SWM practices because the model has no means of motivating and/or coercing restaurants to affect their behavioural intentions in the case of SWM. It is important to inform and train employees about waste reducing practices and motivate them to strengthen their contribution to the programme (Cummings 2017; Trung & Kumar 2015).

Cummings (2017) suggested that the food waste is not tainted which is a significant consideration for customers in the recycling scheme of restaurants waste. Several methods may be used to allow customers to divide their recyclable materials, to provide another bin for recyclable materials in the space or near the elevator. Hayward (2014) observed a positive change in market attitudes to environmental concerns. Several restaurants have posted strong consumer participation rates, such as Anaheim and Disney's Disneyland Park, documented in restaurants turnover programmes. Waste on Line's (2016) waste hierarchy offers a variety of options for various waste types (prevention, minimization, reuse, recycle, recovery and disposal).

A solid waste reduction initiative may be implemented in a Restaurants, providing an eco-friendlier restaurant that can save significantly on waste transportation costs. This is especially true when solid waste becomes a big environmental issue, and waste fees are rising. Food waste, which also accounts for most of the waste created in restaurants and lodging establishments, is also part of the solid waste program. Table scraps, cooking losses, and packing defects result in food waste accumulation during storage. As spoiled food and even remaining scraping can be composted, restaurants increasingly learn that using organic products is safer than using composting in sites.

2.2.6 Readiness of Restaurants to Reduce, Reuse and Recycle Solid Waste

By collaborating interdependently to implement sustainable practices, sustainable practices will integrate into management strategies. Kim et al. (2015) suggested a correlation exists between a general manager's contribution to a healthy atmosphere and how the restaurants impacts the environment. Restaurants decision-makers are general managers. They are responsible for ensuring that team members make an attempt to satisfy their visitors' needs.

Managers are also responsible for the detrimental environmental effects of their restaurants activities, so they should be committed to the environment (Patiar & Wang, 2016; Sun-Young & Levy, 2014). Kim et al. further explained that "environmentally aware restaurants managers are likely to influence their organizations according to their own expectations and personal beliefs" (p. 1500). As part of their corporate plans to minimize solid waste production and all other detrimental environmental effects on their restaurants, managers with environmental backgrounds are likely to follow sustainability initiatives, improving the restaurant's reputation and leading to sustainable development (Popa, 2017).

Employees play a critical part in the hospitality industry's success. Many chain restaurants work to achieve ways to save electricity and water, ensuring that sustainability activities benefit their individual restaurants. Even so, staff turnover has increased in these restaurants. Workers oppose transition and want to retain their everyday tasks. Chan, Hon, Chan & Okumus (2014) concluded that staff with strong ecological behavior prefer green activities whether they have environmental consciousness, environmental interest and environmental awareness.

These three variables increase the ecological activity of workers and therefore increase their probability of becoming environmentally aware. A study by Chan et al. (2014) showed some form of ecological mechanisms are required to incorporate the environmental management system of managers to enhance employee's environmental awareness, understanding, and concern. Managers' attitude or atmospheric actions may promote or influence the effect of their employees on the climate. When managers are highly environmental, they are probably more able and willing to obey this norm at a restaurants (Abdelmotaal & Abdel-Kader, 2016). This form of behaviour can be seen in a restaurants.

Kim et al. (2015) indicated that many business leaders realise that socially responsible business practices are incorporated into their corporate strategy. Instead of making an effect on the well-being of their clients, administrators have focused on the financial results of their businesses (Abdelmotaal & Abdel-Kader 2016). CSR will improve the prestige of an organization if it has a positive influence on culture. Employees will contribute to a sustainable perception of CSR in the hospitality sector. Employees are more sensitive to CSR and more likely to share in the growth of restaurants in the CSR (Kim, Kim, & Lee, 2015).

The training of workers to use, eliminate and recycle their energy by restaurants who follow both Green Practices and mitigates the effect on the environment. CSR would affect employees' retention and lower turnover rates, allowing restaurants to lower costs and boost their competitive market position over the long term (Kim, Kim & Lee, 2015).

2.2.7 Solid Waste Management Processes

The method surrounding solid waste management includes: eco-friendly separation of origins, processing, packaging, transport and recycling of solid waste. This are the six major elements shown in Figure 2.2 below.

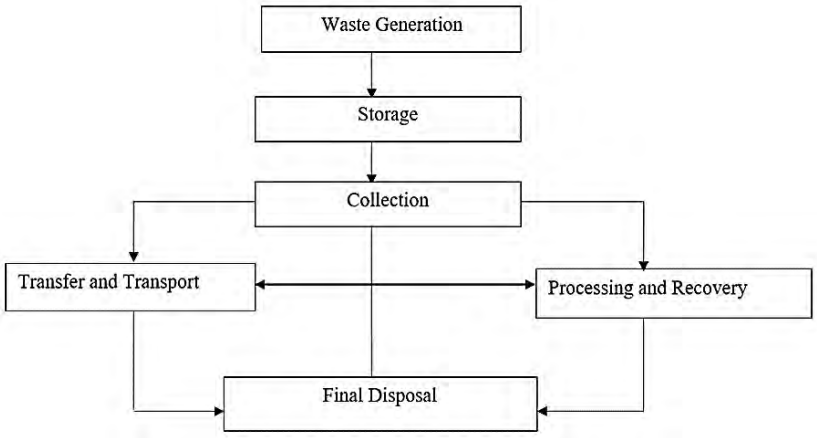

Figure 2.2: Key Elements of Solid Waste Management

Source: Puopiel (2010)

The key components of solid waste management, as seen in Figure 2.2 above include waste generation, collection, storage, transition and transport, recycling and recovery and final disposal. This means that it is first stored in dustbins or skips when the waste is created. It is then deposited in a dump site and finally disposed of. In comparison, solid waste can be transferred from a small recycling plant, such as a tricycle, to a bigger waste collection truck when waste is collected. On the other hand, the waste collected could be processed and recycled for the goods to be reused. These elements are further elaborated below:

Momoh & Oladebeye (2010) defined the generation of waste as an activity in which objects are deemed no longer to be used and may be disposed of or collected for disposal. According to UNEP (2009), the total amount of municipal solid waste (MSW) produced worldwide reached 2.02 billion tons in 2006. It is further estimated that global municipal waste generation would rise by 37.3 per cent between 2007 and 2011, equal to an increase of about 8 per cent per year (UNEP, 2009). The program also estimates that according to WHO statistics, average health-care waste per person per year in most low-income countries varies from 0.5 kg to 3 kg.

This should, however, have been clarified by the organization and thus, the subject of discussion has not been exhausted. It is agreed that the generation of solid waste in the world is rising more rapidly, as the UNEP suggests, and this has been verified in Ghana by Mensah & Larbi (2005).

The storage of solid waste until it is collected is clarified in Tchobanoglous et al. (2013). It should be kept in a skip or in waste containers not indiscriminately thrown away. As per them, it is of primary importance to understand the esthetics of storage.

The collection aspect involves not only the solid waste collection, as well as the transport of waste during collection to the car emptying stage (Kreith, 2014). Kreith

(2014) notes that "curb" is the most common form residential recycling systems in the USA, "set-set-back" and "carry backyard." According to the USPS (10), solid waste collections in households in Thimpu, Bhutan were collected in commercial installations at strategic locations in the city of Thimphu, Bhutan, using trucks/ tractors.

Concrete bins and tanks were supplied at various points from which the waste was disposed. In certain cases, emptied directly into the trucks/tippers, individual bins/containers were put next to the stores. This prohibits individuals from indiscriminately wasting waste. The design of these concrete bins and containers, on the other hand, can be costly in Ghana.

Shift and transportation require two phases, according to Kreith (2014): (1) Moving waste from a smaller disposal truck to a bigger transfer system and (2) corresponding transportation of waste, usually to long-distance final disposal location.

The recycling and recovery section includes all technologies, services and machines used to increase the performance of other valuable goods and to recycle usable materials, manufacturing objects or energy from solid waste (Tchobanoglous et al., 2013). Separation activities were planned to extract essential resources from mixed solid waste to transfer stations or solid waste treatment plants during the recycling process (Tchobanoglous et al., 2013).

The final destination of all solid waste be it domestic or industrial waste is collected and transported directly to landfill sites. After several authorities explain the numerous elements in the diagram, the next segment analyzes the final solid waste approaches in more waste disposal. Over the years, many techniques of solid waste management have evolved. According to the Center for Environment and Development (2013), these methods vary widely with waste types and local circumstances. This

section is divided into early waste management methods and new approaches to waste management systems for the purposes of this research.

2.2.8 Solid Waste Management Practices

According to Tchobanoglous et al. (2013), the most widely-recognized approaches for final treatment of solid waste have been used:

- Dumping on land, canyons and mine pits
- Dumping into water
- Plowing into the dirt
- Feed the Hogs
- Reducing and incinerating

Many of the hazardous solid waste practices reported during early recycling practices still remain in counties, towns and villages today. Unwarranted disposal on open land and dumping in gutters are clearly evident in cities and towns, while dumping in water is increasingly common, particularly for people living in coastal towns.

Burning of dumps is also popular in rural and peri-urban communities in Ghana and many other less developed countries. A study conducted by Momoh and Oladebeye (2010) in Ado-Akiti, Nigeria, showed that solid waste disposal techniques include dumping of waste in gutters, drains, roadsides, illegal dumping sites and streams during the rainy season and incineration of waste during the dry season at unauthorized dumping sites. This has shown that solid waste management activities still exist in the 1950s, and there is no exception in the area of science. On the other hand, Momoh & Oladebeye's (2010) assessment of the waste situation in Ado-Akiti, Nigeria, is unclear as they have not explained further what led to the uncontrolled dumping of waste. Since there were no skips or dustbins for people to store their waste for disposal, some kind

of people had disposed of the waste. After discussing how solid waste was disposed of in the early days, the next section deals with current waste management practices.

2.2.8.2 Contemporary Solid Waste Management Practices

Solid waste management approach in modern times include waste disposal, sanitary landfills, composting, recycling and incineration

Denison & Ruston (2010) considered the reduction of the waste source as any operation prior to its treatment and disposal in incinerators or landfills that reduces the volume or toxicity of solid waste. This view is close to that of Kreith (2014). Source reduction, according to him, focuses on reducing the quantity and/or toxicity of waste produced. Reduction of the source entails the transition to recycled goods and packaging, with returnable bottles being the most familiar example. In order to mitigate waste problems in the future, reducing the generation of waste will be the most significant factor, according to USPS (2010). Reuse of containers (including bags), improved purchasing practices and reducing the use of disposable goods and packaging are examples of potential reductions in consumption levels (USPS, 2010).

It is accepted that the isolation of sources and the re-use of resources are an effective tool for waste management. This is because there's nothing like waste on this planet. In another setting, the waste that is discharged may be of considerable value, but it is of little or no benefit to the owner who wants to dispose of it. According to Tsiboe & Marbel (2014), Austria, the Netherlands and Denmark have built waste management processes in order to effectively solve the waste disposal problem by, essentially, coaxing their people to divide the waste they generate into categories of plastic, paper and glass, making it easy to collect and then reuse. One way to manage

solid waste efficiently, as suggested by the three authors, is to minimize the production of solid waste through the reduction of sources.

Filling the sanitary land requires the containment, compacting and soiling of the garbage. Not only does it prevent the burning of refuse, but it also allows land to be reclaimed for beneficial use (Centre for Environment and Development, 2013). Deposition of solid waste in landfills is the oldest form of recycling and probably the most common (Zerbock, 2013). He also said that "landfills" were only open dumps, mostly monitored. According to him the difference between landfills and dumps is the amount of infrastructure concerned. Open dumps are characterized by a lack of engineering protocols, no leachate regulation, no concern for the management of landfill gas, and few, if any, operational controls, such as customer registration, tip front monitoring or waste compaction (Zerbock, 2013).

In addition, dumpsites are one of the waste management methods that nobody wants, but that everyone needs (Kreith, 2014). There is simply no mix of waste management approaches that do not require landfilling to make it work. Of the basic options for the management of solid waste, landfills are the only appropriate and necessary management scheme. Indeed, according to Kreith (1994), some waste is not recyclable, many recyclable waste gradually reaches a stage where the inherent value is fully dissipated and can no longer be recovered, and recycling itself produces residues. He also stressed the need for new landfill technologies and operations to protect human health and the climate.

In comparison to what many writers have said about waste disposal as a waste management option, they have not realized that landfilling in itself has some disadvantages because it is costly to build and maintain, it can pollute groundwater by percolating, and the location is also problematic, especially in cities, in terms of land

accessibility. The authors have not specifically defined other significant variables, such as gas recovery, energy recovery waste, composting, stormwater management, distance between human settlement and water bodies. There may, therefore be a recycling alternative.

Momoh & Oladebeye intimated that recycling has been used as a real way of reducing the amount of solid waste generated from domestic use entering the dumpsites (2010). It makes the requisite raw materials available to the industries. However, it may not be cost-effective in developing countries such as Ghana. As one of the most efficient waste management techniques recommended for recycling by the United States Environmental Protection Agency (USEPA) (2009). According to USEPA, recycling converts waste materials into usable resources and produces financial, environmental and social returns for the conservation of natural resources, energy conservation, Reduction of pollution and economic expansion and productivity. More importantly, a substantial portion of what is thrown away contains valuable resources that can be reprocessed and reused as raw materials: metals, glass, paper, plastic and wood (USEPA, 2009).

Kreith (2014) recycling has to do with the favored and viable choice for the management of waste. Recycling would return to the market by eliminating discarded items from the bulk of industrial wasteIt saves precious limited resources and eliminates the need for fresh resource production and reduces the environmental impact of mining and production. For example, the Institute of Waste Management cited by Tsiboe & Marbel (2014) argued that only 11 per cent of household waste is recycled by the United Kingdom, only 3 per cent by Italy and Spain, 43% by the Netherlands, 29 per cent by Denmark and 50 per cent by Austria. Several academics have advocated recycling as the best way to handle solid waste in modern times; they have overlooked the expense

factor that is crucial to any successful recycling program. Moreover, it cannot be efficiently controlled by developed countries. Instead, it could be a safer choice for the successful management of solid waste in Ghana.

The composting mechanism utilizes microorganisms to degrade organic waste. Aerobic composting operates better and allows heterogeneous biological waste products homogeneous and safe (Environment and Growth Centre, 2013). UNEP (2009) defined composting as biodegradable solid waste decomposition, which is essentially uncontrolled under aerobic conditions in an extremely strong form for storage and handling without contamination and is sufficiently mature for sustainable use in agriculture. According to UNEP (2009), composting is ideally tailored to restricted options for developing economies, with few exceptions. The characteristics making composting extremely appropriate is adaptability to different conditions. Composting is a low-tech waste-reduction solution, says Zerbock (2013). He also points out that more than 50% of urban waste is renewable in developed countries.

As per the Climate and Development Center (2013), incineration is a managed combustion method to burn fuel waste into gases and convert it to non-combustible ingredient residue. During incineration, solid waste moisture is vaporized and the fuel component is oxidized and vaporized according to the Centre. $C0_2$, non-combustible material, water vapour, ash and are incineration end items. Incinerators will significantly minimize the volume of waste, up to nine times greater than any other system (Kreith, 2014).

According to the source, even utilizing steam or electricity, incineration will recover valuable resources. However, he noted that the key incineration limitations are high maintenance costs, a comparatively high degree of complexity required to run them efficiently and economically, and the ability to pollute the atmosphere by carbon

dioxide emissions. Literature has demonstrated that there is an alternative approach to successfully handle solid waste, compatible with waste conservation and recycling, after reviewing the key approaches suggested by the various scholars. The next portion of the study determines this.

2.2.9 Solid Waste Management Strategic Action Plan

For waste management preparation, reliable data on solid waste production, affecting waste generation factors and data-based forecasts are required (Lebersorger & Beigl, 2011). According to Asase (2013), there is no particular solution to solid waste management that renders it effective, but the concepts of integrated waste management should be implemented to lead the introduction of a site-specific, sustainable MSW scheme, as seen in London City. For Thorneloe et al. (2015), determining the right approach to handle solid waste at Cagliari's 10th International Waste Treatment and Landfill Symposium is not easy.

However, waste management is distinguished by ready-made recommended responses, with single-issue pressure groups pushing one approach at the disadvantage of others (Read, 2013). The reality, he concluded, is that no one approach will effectively handle society's waste. Therefore, solid waste management, based on an interconnected framework, is recommended to combine several diverse techniques in operation.

An integrated waste management strategy has now given way to thinking about and attempting to incorporate the disposal of waste openly into the biosphere. 'Integrated waste management' has been described by the United Nations Environment Programme (UNEP) as *a framework of reference for the design and implementation of new waste management systems and for the study and optimization of existing systems*.

This hierarchy is characterised as: "reduction, reuse, recovery, recycling, treatment and disposal" (Seadon, 2006) implementing a long-term and efficient solid waste management system in a societal context requires an integrated approach to addressing all aspects of the 6-tier waste management program. Such a proposal should be drawn up in the preparation of a national integrated solid waste management plan, taking into account the sources of waste generation, quantity, characteristics and the socio-economic and cultural context of the sector (Asase, 2013).

Moreover, civic interest in the campaign to gain societal recognition is important, and communication is a vital aspect of sustaining public involvement. Communities should be involved in waste management decision-making. To get feedback and help from the community, the findings of the waste management method should be shared and suggestions proposed with the organization (Seadon, 2016; Asase, 2013). A sustainable waste management policy cannot neglect corporate consultation and cooperation. In New York City (NYC), for example, an IWM project was initiated in 1988 focused on solid waste streams (Clarke, 2009).

With two main general outlooks, a 20-year plan of 12 consultancies produced 12 separate outcomes. Half advocated for a waste-to-energy facility and associated composting and dump sites, and the other half used a combination of recycling stations, processing plants, composting and landfills as their substitutes. Interestingly, the Citizen Advisory Boards opposed all 12 initiatives in 1992, calling for a plan after meeting with neighborhoods that concentrated on minimizing and recycling sources. However, thanks to the overwhelming encouragement of the Advisory Commissions, NYC agreed to support the results of the proposal and mechanism (Seadon, 2016). Thus, what could make sense for one organization may be somewhat different for another, based on existing infrastructure, plans, and environmental goals. Therefore

when designing reliable and successful management methods, site-specific analyzes are crucial (Thorneloe, 2005). The USA made substantial strides in increasing recycling rates. However, potential solutions such as waste conversion strategies and waste recovery systems are getting more difficult and material-specific (Thorneloe, 2005).

2.2.9.1 Integrated Solid Waste Management

While several governments and other agencies are making substantial efforts to tackle waste-related issues, there are still significant gaps in this field (UNEP, 2009). The World Bank reports, according to UNEP (2009), that municipalities in developed countries are likely to expend about 20 to 50 percent of the budget on the management of solid waste in developing countries, despite the fact that up to 60 percent of all urban solid waste remains uncollected. The Programme (UNEP) suggested that a substantial reduction in final waste volumes could be achieved if much of the waste could be diverted for the recovery of materials and resources and that the materials and resources recovered could be used to collect revenue to fund waste management. This forms the foundation for the principle-based Integrated Solid Waste Management (ISWM) system of 3Rs (reduce, reuse and recycle).

The ISWM scheme has been tested in a number of locations (Wuxi, PR China; Pune, India; Maseru, Lesotho) and well received by local authorities. It has been shown that, by means of an efficient segregation and recycling system, large volumes of waste can be converted into energy from landfills (UNEP, 2009). Likewise, the United States. Environmental Conservation Organization (2009) argued that if a state or local authority wants to plan and implement ISWM, it must accept a hierarchy of approaches to disposal, recycling and incineration/landfill.

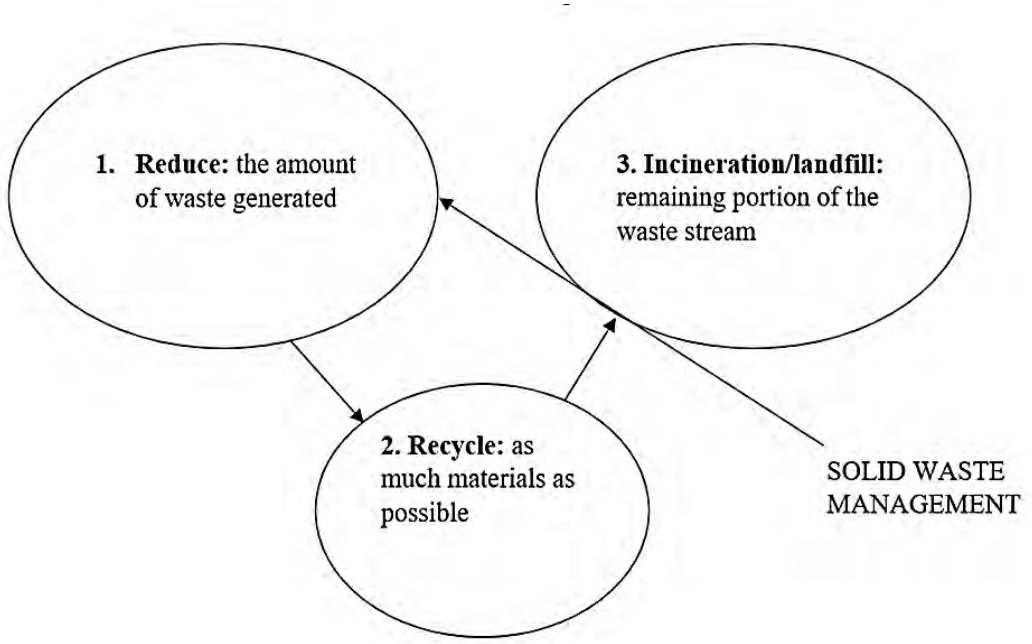

Figure 2.3: Model of ISWM

2.2.10 Environmental Management Policies and Practices

Many waste management policies are relevant at regional, state and local levels. For eg, the International Convention on the Prevention of Marine Contamination through Waste Disposal and Other Matters (1972) and the Basel Convention on the Control of Hazardous Waste Transboundary Movements (1989). There are rules to preserve the atmosphere in Ghana. Such law involves, but is not limited to, Act 462, Environmental Conservation Agency Act (1994), Act 490, Pesticides Control and Management Act (1996), Act 528, Environmental Appraisal Act 1999 (LI 1652), Ghana Environmental Sanitation Regulation (2010). Mariwah (2012) indicated that Ghana has nearly all waste management agencies, divisions and policies at all levels of government, from central government to local unit committees.

Waste management is the responsibility of the Ministry of Local Government and of the Ministry of Rural Development, which oversees the Metropolitan, Municipal and District Assemblies. However, the regulatory authority is held by the Ministry of

Climate, Science, Technology and Innovation within the Department of Environmental Protection (EPA). The Metropolitan, Municipal and District Bodies are responsible for the storage and recycling of solid waste through their Waste Control and Public Health and Health Units (Mariwah, 2012).

Environmental Conservation Agency Act 462 (1994), Act 490, Pesticide Safety and Management Act (1996), Act 528, Environmental Evaluation Regulations 1999, (LI1652), Ghana Environmental Sanitation Policy (1999), Deve Regulations are the National Environmental Sanitation Plan (1999), a policy framework for the handling of radioactive, solid and nuclear waste. Guidelines for environmental impact evaluation are the only recommendations that indirectly prohibit unhealthy practices and promote safe use and production. Environmental risk evaluation is a legislative obligation (Act 528) and recommendations have been developed in partnership with the private sector by the Environmental Management Agency (SMA, 2006). Though Ghana has many of these policies for direct waste management, the implementation of these regulations has been troublesome. In conjunction with poor structural mechanisms and resources, there are challenges to the introduction of solid waste management in Ghana.

2.2.10.1 Ministry of Local Government and Rural Development (MLGRD)

The MLGRD is the ministry which is the country's core agency responsible for the sanitation sector. The National Environmental Sanitation Policy Coordination Council (MLGRD, 1999) is responsible for developing and coordinating sanitation policies, providing recommendations on waste management and supervising them. The MLGRD is expected to have overall responsibility as guidelines for the MMDAs in the country to formulate environmental sanitation policies.

2.2.10.2 Environmental Protection Agency (EPA)

The Environmental Protection Agency (EPA) aims to ensure that all renewable and non-renewable resources are used in an environmentally sound and effective manner, to avoid, mitigate and eradicate pollution and to reduce the quality of life; and also apply legal mechanisms in a reasonable and equitable manner to ensure the country's acceptable environmental behaviour. The Environmental Protection Agency in Ghana is the state agency with the oversight responsibility to exercise public authority for the protection and improvement of the environment. Their job is to ensure that everyone in today's society looks after air, land and water so that the next generations inherit a safer and healthier world.

2.2.10.3 Environmental Sanitation Bye-Laws in the Sunyani Municipal Area

When it comes to protecting the environment and the people who rely on it for their livelihood, environmental laws and regulation are important. The Assemblies are encouraged by the government through MMDAs to use bye-laws to make citizens responsible and environmentally aware. These by-laws or legislative initiatives laid down by the Municipal Assembly may be traditional environmental evaluations or public policies aimed at encouraging voluntary action to improve the management and safety of urban sanitation. In Appendix C, descriptions of the sanitation by-laws are presented.

2.2.10.4 The summary of the Sunyani municipal area environmental sanitation bye-laws includes the following:

Sunyani Municipal Assembly (Sanitation) bye-laws, 2007 - General sanitation or hygiene is also covered in this bye-law. It defines what constitutes a sanitation offence and what should not be done to cause pollution in the municipality by both landowners and pedestrians.

Sunyani Municipal Assembly (Cleansing) bye-laws, 2007 - The bye-law on cleansing governs operations that facilitate visual pollution and nuisances and prescribes penalties for such offences.

If those who produce the waste do not dispose of the waste properly, they encourage poor sanitation of the environment in the municipal area. All of these negative practices, if left unchecked, would lead to an increase in sanitation-related diseases and deterioration of people's health conditions, contamination of the environment and an increase in the cost of providing sanitation services, particularly for the collection of waste. They, therefore, call for a new management strategy in the Sunyani Municipality of the Bono Area to improve environmental sanitation and reduce sanitation disorders.

Through behavioral management and law enforcement through regulatory management, these management techniques that should be implemented to enhance environmental sanitation and eliminate sanitation diseases are attitudinal change. These management techniques include activities that would ensure that individuals recognize the effects of bad practices of environmental sanitation and the benefits they would reap from practicing good conduct towards environmental sanitation. This could be achieved by education and proper compliance by MMDAs in the country of the bye-laws on sanitation. Regulatory management requires practices to ensure that individuals comply

with good sanitation requirements that can be accomplished by implementing sanitation laws and bye-laws to punish offenders.

These methods are accomplished by education and adherence. Once residents are fully informed of environmental sanitation, they become vigilant and willing to mobilize themselves to obtain facilities that will guarantee decent local sanitation standards, even though they are not supported by local government. If these two management techniques are well applied in Ghana's Bono Region's Sunyani Municipality, they will contribute to good environmental sanitation and minimize sanitation-related diseases.

2.2.10.5 Sunyani Municipal Assembly Solid Waste Collection and Disposal Bye-Laws, 2007

Exercising the powers bestowed on the Sunyani Municipal Assembly by section 79 of the Local Government Act of 1993 (Act 462) these Bye-Laws are hereby made:

a) The Assembly may for the purpose of the management of solid wastes generated within its area of authority, divide the area into solid waste collection service areas.

b) The Assembly or its authorized agents' franchises or contractors shall serve notice of commencement of solid waste collection services in areas specified for particular services and days for collection.

c) Schedule 2 of these Bye-Laws specifies the area designated for particular collection services and days.

3. The Assembly may engage a licensed contractor or franchisee for any such terms as may be agreed upon by the Assembly.

4. All occupiers/owners of premises within a solid waste col1ection services area shall register with the authorized provider of such service.

   a) All occupier/owners of premises within a solid waste collection service area shal1, prior to collection of the waste, store it on the premises in a container of a type approved by the Assembly for the type and level of service provided in such area, in accordance with Schedule 3 of these Bye-Laws.

   b) All occupiers/owners of premises within a solid waste collection service area shall place such container for col1ection on the day, at the time and in the manner as may be announced by the authorized provider of such service.

5. Solid waste thus made available for collection shall remain at all times the property of the Assembly.

6. Any occupier/owner of premises within a solid waste collection service area may, notwithstanding the other provisions of these Bye-Laws, engage a licensed collector to collect solid waste from the premises subject to the approval of the Assembly.

7. The Assembly shall designate a safe and accessible site or sites for treatment and/or final disposal of solid waste and shall for this purpose provide or cause to be provided such infrastructure as may be necessary.

   (a) No individual shall put or dispose of any solid waste at any location, cause or intentionally authorize the disposal or disposal of solid waste at any site, or use any vehicle plant or facility for the purpose of planting or depositing solid waste, unless the site where the waste is deposited or disposed of is designated for solid waste treatment and disposal and the person is licensed

8. Schedule 4 of these Bye-Laws indicates the type of wastes acceptable at the assembly's designated solid waste disposal sites.

9. A licensed contractor shall not collect any hazardous or health care waste from any place unless such collection has been approved by the Assembly.
10. The Assembly shall determine the manner of disposal of all hazardous or health care wastes.
    (a) The collection of solid waste shall be subject to charging of fees as approved by the Assembly in its Fee Fixing Resolution. If the collection is carried out by a franchisee, such fees shall be payable directly to the franchisee.
    (b) The Assembly may charge tipping fee for the placement of allowable types of solid waste by licensed operators at any designated disposal site for solid waste as approved by the Assembly in its Fee Fixing Resolution.
11. Anyone who has:
    (a) participates in the recycling of solid waste in every place where the Assembly has not granted them permission to do so;
    (b) Failure to register with the Solid Waste Collection Service Provider approved by the Assembly for their district.
    (c) inability to have permitted containers for disposal of waste in their premises;
    (d) declines to encourage the Sunyani Municipal Assembly of its approved service provider to collect solid waste from their premises;
    (e) failure to allow their collection of solid waste accessible for collection on the day, period and manner stated by the approved service provider;
    (f) provides solid waste disposal supplies from an unregulated service provider;
    (g) solid waste bums in their premises;
    (h) the location or dumping of some waste at an illegal disposal site;
    (i) Failure to pay any collection or tipping or discharge fees authorised by the Assembly;

(j) the location or disposal at any designated disposal site of any waste not appropriate at the disposal site as stated in Schedule 4;

(k) Receive any toxic or health-care waste from any site without prior permission by the Assembly;

(l) Dumps solid waste in an open field, streams, gutters, sewers, open land, quarries, river canals, swamps or areas not designated by the Assembly for that reason commit an offence.

2.2.11 Problems of Managing Solid Waste

According to Palczynski (2012), waste collection plays a key role in waste management systems. Processing is a crucial aspect of the solid waste management chain, linking the method to disposal. The collection method comprises a number of elements like collection device, special machinery, collection site roads, including loading and unloading operations (Baptiste, 2017). Ghana's waste management methods include door-to-door system (which also involves the Bordeaux process) and municipal waste collection.

World Resources Institute (2016) reports that one to two thirds of solid waste produced in cities in developing countries is not collected. These uncollected wastes are dumped indiscriminately in the drains and on the principal streets. This contributes to the flooding situations in some of the communities in the cities, breeding of insects and rodents and the spread of diseases (World Resources 2016; Zurbrugg, 2012; Mosler et al., 2015). However, the waste that is collected is disposed off on land, which is often done haphazardly, or in an uncontrolled manner (Mosler et al., 2015). The effects of unregulated waste management have significant consequences for the economy and well-being of the people as well. The existing services, including soil, water and also the environment, are depleted as a consequence of the indiscriminate dumping of waste.

The inefficient and ineffective application of waste management approaches has become central to many discussions concerning the progress of Sub-Sahara countries-good governance. Good governance includes the effective management of collective relations by a combination of private, public and voluntary actors. It includes visionary leadership and integrates implemented by-laws (Thompson, 2013.). Where there is good governance, there is the enforcement of law and people are fined and punished when they fail to comply with the law. Ghana has established sets of comprehensive environmental laws; however, the leaders in authority lack the means to enforce these laws.

According to Ogawa, a traditional solid waste management system in the developing world has a range of challenges, including poor recycling coverage and inconsistent collection systems, raw open dumping and air and water-free combustion (2015). These were categorized into technical, economic, structural and social boundaries. Sees vulnerabilities have addressed solid waste sustainability in developing countries.

According to him, there is a lack of human resources in most developed countries, both globally with the technological skills required to train and serve solid waste management. Many waste management officers have little or no technical or engineering or management experience, particularly at local level.

2.2.11.1 Financial Constraints

Ogawa (2015) indicated the poor importance of solid waste management in developed nations, with the likely exception of capital and major towns. Decision-makers thus encourage only a few funds to be rendered accessible to the solid waste management sector which will not reach the amount of facilities needed to support public health and the community. The issue is crucial at regional level, where the local

tax structure is terribly organized, as the funding base for city services, like solid waste management, is thin. User premium payments will complement this poor local financial foundation. However, consumers' ability to compensate for facilities in developed industrialized countries and their tendency to pay for erratic, inadequate services is quite weak.

He points out that at national level, at least in part, multiple organisations are typically interested in handling solid waste. However, he said there are often no specific roles or duties identified by the various national bodies in relation to solid waste management and there is also no central agency or committee appointed to monitor their projects and activities.

> *"...The absence of cooperation between the appropriate agencies also results in various agencies being a national counterpart to multiple external support agencies for joint initiatives on different solid waste management projects, without understanding what other national agencies are doing. This adds to duplication of efforts, capital depletion and unsustainability of overall solid waste management systems. The absence of appropriate regulations for solid waste management, a practice in most developed countries, is partly responsible for not specifically specifying the roles/functions of the various national entities and the lack of cooperation between them" (Ogawa, 2015).*

The law on solid waste management (Public Health Act, Municipal Government Act, Environmental Conservation Act) is typically divided. Zurbrugg (2009) also added that municipal solid waste management systems usually include just a limited portion of the developed world population. Typically, individuals live in peri-urban areas lacking waste disposal services are the low-income population. According to him, one of the main reasons is the shortage of financial capital to cope with increasing waste generated by rapidly growing cities.

Inadequate rates charged and inadequate local municipal budget accounts are also unable to cover sufficient service standards. He observed that apart from financial limitations impacting a waste collection service's availability or feasibility, the systemic

inefficiencies of solid waste schemes, such as lack of installation management capabilities and insufficient equipment, have an effect on effective waste management. Thus, Zurbrugg (2009) highlights the key waste management challenges, including financial and structural restrictions.

In a study by Anomanyo (2014), he identified some issues related to the successful solid selection that have been outlined as follows:

2.2.11.2 Inadequate funds and logistics

Like other sub-Saharan countries, Ghana faces the problem of providing adequate logistics in terms of container manufacturing, waste transport and recycling, leading to inadequate collection. The state of infrastructure services is insufficient and under-maintained. Both of these are the result of a shortage of funds to buy these products. Anomanyo's work has shown that 80 per cent of the waste management service in Ghana is free of charge. Mostly waste management agencies are not pursuing income generation, since all running expenses come from government subsidies. Many of the cars included in the collection are old and not repaired because no repair funds are present.

2.2.11.3 Difficulty applying Service Charges

Owing to insufficient structures and lack of sufficient building demarcation, a low population database has little access to waste disposal facilities. Public assemblies cannot generate funds internally and they cannot reach household places. By contrast, areas are not clearly demarcated, and buildings are dispersed. The implementation of service charges for environmental change is therefore challenging. The belief by many families that the government should not conduct effective activities is combined with

this challenge. This provides a leeway for non-payment because many households believe that there is a high risk of government mismanagement of the service.

2.2.11.4 Nature of roads within the city

Roads are either under repair or in very bad condition, e.g., in certain cities and towns in the Greater Accra area. This influenced the potential of certain waste collection sites to be met through waste suppliers. Typically, these waste trucks are either stuck in mud on the highways or broken down. Waste bins are filled and uncollected for weeks to months. This uncollected waste is recycled to the communities by natural processes such as rainfall, air, and human and animal activities. Both the above factors are primarily the result of poor governance. If environmental law is specifically applied and convicted parties charged, residents may practice proper waste management.

2.2.12 Impact of Solid Waste Management

When pursuing an integrated vision of solid waste management in developed nations, diverse views ought to be addressed. The following perspectives for introducing SWM problems in developed countries will be given: climate and health, fiscal, socio-cultural, planning and management.

2.2.12.1 Environment and Health

Ineffective disposal of solid waste is a major cause of environmental pollution in emerging parts of India, such as Indonesia (Listyawan, 2007). Wisnu (2009) reported that 60% of solid waste in Bali is not properly collected or disposed of and instead discarded in "informal" landfills, the ocean or along roads. Indonesia's residents, government and industry have drawn attention to the need to improve public cleaning and solid waste management (Listyawan, 2007).

Waste pollutes soil, air and water, obstructs drainage processes, poses significant risks to public health and restricts future land use (Pernia, 2012; Haan, Coad & Lardinois 2008). Accidental gas combustion and intentional burning at dumpsites (Thomas-Hope, 2008). Garbage fire smoke and poisonous substances. Soil, soil and groundwater can be polluted with leachate. Accumulated moisture in cans and bottles triggers freshwater dengue fever and yellow fever (Pinnock, 2008). Vectors like mosquitoes, bees, cockroaches and rodents produce solid waste (Pinnock, 2008). Insects, rats, goats, insects, air and water emissions and food poisoning are the direct and indirect communication routes (Pinnock, 2008).

Similarly, Fedorak and Rogers (2011) described three pathways to disseminate micro-organisms from a waste disposal site. First, leaching through reservoirs, second, airborne spores, and last, bacteria eating or collecting life types. Waste may involve a vast amount of micro-organisms, such as facial tissues, animal waste, soiled slices and rotting food (Fedorak & Rogers, 2011).

Staff health facilities are typically not accessible in developing countries (Jindal et al. 2008). A variety of occupational health problems, such as discomfort, nausea, exhaustion, injuries, accidents and emergencies, can be encountered by people working in the waste management industry. Several negative health effects like eye irritations, lung diseases, asthma, leg cramps, back pain, arm pain, dental issues, parasitism, intestinal disorders, diarrhea, skin diseases, major headaches, lacerations, puncture injuries, minor incidents and mental health concerns are recorded by waste pickers at dumpsites (Lohani & Baldisimo 2011; Pinnock 2008). Unhealthy environments (smoke, pollen, faecal matter, rodents, insects), unsanitary activities (food contamination), heavy loads, shipping, mechanical devices, the quality of the products

being treated, the degree to which measures (gloves, boots, etc and cleaning facilities lead to these diseases (Lohani & Baldisimo, 2011; Lardinois & van de Klund, 2011).

Security equipment such as earplugs, face masks, gloves and suitable footwear is often not used by the staff as well as the need for health and safety awareness (Thomas-Hope, 2008). There have been major health hazards in many working environments due to lack of precautions, unsafe practices, extreme heat, noise, dangerous environments (dust, dangerous materials), polluted waste and long working hours (Lardinois & van de Klundert, 2015; Habitat 2014). Standards need to be increased, and labour and health legislation improved, but many informal recycling activities do not comply with them even though regulations exist (Lardinois & van de Klundert, 2015). The lack of compliance is a common problem in developing countries in Asia (Jindal et al., 2008).

2.2.12.2 Economic

On average, Bangkok, Kanpur, Jakarta, Karachi and Manila spends around US$15 million annually on waste generation and recycling (Habitat, 2014). The costliest elements of the system are typically the selection and transportation stages (Jindal et al., 2008). Even though municipal governments spend 30-50 percent of their operating budgets on the management of solid waste, only 60-70 percent of the solid waste in cities can usually be collected (Habitat, 2014).

By prolonging landfill existence, removing the need to invest in transport equipment and machinery, decreasing vehicle service and maintenance costs and minimizing waste fuel use, waste recycling will reduce local authorities' waste management costs (Habitat, 2014). Low-cost raw resources are accessible to enterprises. In several countries, the steel, paper and glass industries depend on recycled materials (Jindal et al., 2008). Importing raw products is minimized by utilizing

reclaimed materials, meaning that capital is expended on foreign exchange. The prohibition on international shipments of waste helps avoid the lack of local markets for recycled goods and dangerous environmental and health issues (Habitat, 2014).

Local entrepreneurs are based on the attractiveness of recycling. When simplified and more homogenously composed virgin materials are available, the costs associated with the use of recycled materials can be more costly than those associated with virgin materials (Jindal et al., 2008). High-quality markets for waste products that are readily available are easier to find. Mixed, contaminated, low-value waste materials have less opportunity for recycling and reprocessing. A recycling rate of 7.5 per cent decreases each city's annual expense by over $1 million, thereby saving future costs as a result of increasing the recycling rate even higher (Habitat, 2014). An estimated 1% of the urban population is in the recycling industry, while 2-3% of the urban population can be recycled if the recycling infrastructure is built up to its maximum potential (Habitat 2014).

Recycling is a manufacturing industry that includes a relatively large number of people, such as waste pickers, travelling refuse buyers, waste dealers, recycling company workers, business managers and entrepreneurs, with relatively low starting cost (Lardinois & van de Klundert, 2015). As a point of entry in the city's economy (Marti, 2011; Panwalkar, 2011), waste recycling also offers economic benefits, greater social standing and technical training to the participants.

2.2.12.3 Socio-cultural

While projects that concentrate on human development and community engagement in waste management sound exciting, they do not come easily (Mungai, 2008). Changing people's attitudes and behaviour in developing countries can be a

daunting task if there is a lack of a culture of collaboration and compliance mechanisms (Thomas-Hope, 2008).

While there is some understanding of waste management concerns, at all levels of society there is a need for greater appreciation of SWM problems (such as waste minimisation) (UNCRD, as cited in Fernandez, 2017). The general population in Asian countries is 'still ignorant of their crude methods of disposing of waste' (Jindal et al., 2008). Vandalism, social isolation and property disrespect are not rare (Thomas-Hope, 2008). The early implementation of SWM reforms could have adverse consequences, such as "illegal dumping, the burning of household waste and the bribing of collection workers to pick up products for which they are not liable" (Figueroa 2008).

A cultural change is required in developed countries to solve waste management problems (Figueroa, 2008). In terms of shifts in expectations of roles and obligations related to waste and the environment in general, and involvement in formal and informal organisations, the cultural transition can be assessed (Figueroa, 2008; Thomas-Hope, 2008). To foster ecological awareness and encourage the public to investigate problems, make decisions and take action, environmental education and student engagement are required (Collins-Figueroa, 2008; Figueroa 2008). Education and public awareness are key elements of any policy involving public engagement and separation of sources, but raising awareness and gaining public support takes time. It is important to redirect the minds and actions of the community towards the common objective of maintaining a beautiful, safe and balanced world (Thomas-Hope, 2013).

In the environmental sector, environmental awareness, and people's willingness to actively engage in waste reduction and sorting initiatives are measures of social capital (Figueroa, 2018). Citizen groups have started to engage in waste management initiatives in Asian cities in response to SWM issues and increasing environmental

consciousness (Furedy, 2017). Public engagement, benefits and policy must be focused on citizens' awareness of environmental concerns (e.g., the use of energy, the development of waste, the cost of waste management) and willingness to improve their daily lives (Figueroa, 2008). To facilitate substantial changes in behaviour patterns, social interactions and relationships between individuals and between individuals and society, the creation of this social capital includes fostering common consciousness, awareness, organization and experience (Figueroa, 2008).

The relationship between waste collectors and society is a major problem for SWM in developing countries. Governments and residents who appear to regard waste pickers as outcasts which constitute a nuisance and a safety hazard also do not recognize the contribution of waste pickers to the recycling of waste (Chaturvedi, 2008). Since they can interfere with recycling and dumping activities, many politicians and residents condemn waste pickers (Jindal et al. 2008; Thomas-Hope, 2008). In general, people involved in waste management have "very poor social and economic status because society perceives that it is demeaning to deal with something that is filthy and thrown away by others" (Habitat, 2014).

The informal sector mostly consists of poor and poorly educated people who, in search of jobs, have migrated to cities from rural areas (Habitat, 2014). Low social confidence, long working hours, insecure environments and health threats are faced by waste pickers (Jindal et al., 2008). Waste pickers earn the lowest profit margins within the informal recycling sector and are also vulnerable to waste dealer abuse (Habitat, 2014). The means of survival for individuals employed in the informal sector may be affected by improvements to the waste management system (Lardinois & van de Klundert, 2015). Integration of waste pickers into the SWM system has been encouraged to boost the health of waste pickers (Chaturvedi, 2008). This can, however,

be difficult because of opposition to waste pickers suspected of being engaged in criminal activities (Furedy, 2017). Furedy (2017) supports efforts to distinguish sources, as well as continuing efforts to improve the living and working conditions of the poor, acknowledging that the multiple agendas of SWM stakeholders can lead to disputes with regard to street picking, public health issues and successful solid waste management.

Waste generation is the processing or handicap of human activities (caused by economic development, urbanization and industrialization) and how this waste is treated, processed, extracted and disposed of poses threats to human economy, health and environment (Zurbrügg, 2012). Adsorption of soil, drying or biodegradation, plant digestion, ventilation, leaching, livestock movement and overt drainage of waste into oceans, rivers and lakes are other means of contacting living organisms of solid waste (Alam & Ahmade, 2013).

These toxic contaminants and bacteria leak into leachate in dumps. Food waste, liquid waste and rainwater infiltrated constitute leachate. Depending on the irrigation method and the soil quality, it may contaminate ground and surface water (USAID, 2009). Malaria accounted for 53% of all outpatient diseases in 1998 and is the leading cause of morbidity in Greater Accra (Thompson, 2013). According to Ghana Health Service data, six out of Ghana's top ten diseases are linked with poor environmental health, with measles, diarrhea and typhoid fever responsible for 70%-85% of outpatient cases in health facilities (MLGRD, 2010; Oteng-Ababio, 2011).

An EPA study on the state of Ghana's environment shows that environmental degradation is a coastal issue, and this, combined with poverty and rapid urbanization, hampers human development. The lagoons have thus been extensively polluted in and around densely populated areas and industrial establishments. For example, due to the

impacts of insanitary practice ices, the' Korle and Kpeshie Lagoons in Accra, Fosu Lagoon in Cape Coast and Chemu Lagoon in Tema were all polluted in various degradation states' (EPA, 2005). These precious natural resources and the services they provide can be lost or substantially damaged by dumpsites or landfills in fragile ecosystems (EPA, 2005).

Food particles lead significantly to water contamination (Alois, 2007). The Korle Lagoon and its tributary (the Odaw River) in the Accra area is the population and industry's largest drainage basin. Much of Accra's factories are in the lower Korle/Odaw basin drainage, which was highly polluted with effluent discharges and waste disposal. Water quality deteriorated, leaving the lagoon unfit to promote thriving fin and shellfish fisheries (UNEP/OCHA, 2011). Around 1,2 million people were infected by tainted water in a UNEP study, which also destroys 15 million children each year (UNEP, as quoted by Alois, 2007).

According to USAID (2009), as agricultural waste is disposed of in deep dumps or landfills, it undergoes anaerobic deterioration and becomes significant sources of methane, a gas with twenty-one (21) times the effect of carbon dioxide on ambient heat-trapping. Garbage is burnt in residential landfills to reduce volume and expose metals. Burning emits toxic smoke containing carbon monoxide, soot and nitrogen oxides that are detrimental to human health and impact urban air quality.

A UNEP/OCHA (2011) Rapid Catastrophe Waste Management Evaluation research showed that negative attitudes and waste disposal practices are partly responsible for regular floods and associated severe effects in most metropolitan areas. For eg, Accra and Tema's June 2010 flood took 14 lives and damaged properties worth millions of Cedis. The floods on October 26, 2011, did much harm to homes and businesses along Odaw River banks. This involved destruction and loss of life (14

individuals), loss of living (affected 43,000 people and 17,000 destroyed their homes) and loss of economic value (damage to highways, rivers and bridges)-UNEP/OCHA, 2011.

Owing to the refuse spreading around the community, the architectural appeal of the city is reduced. The undesirable odor and unattractive presence of uncollected solid waste in sections of the township discourages business activity and hence the city's development. The exposure to the rain and sun of these community containers leads to the degradation of air quality and to the disruption of human activities. Animals such as dogs, cats, hens, goats and others who disperse the waste around in the surrounding areas are readily accessible to the dumpsites (Mudzengerere & Chigwenya, 2012).

Poor urban sanitation and waste management problems are generally articulated in terms of health and environmental issues, as clearly stated by Owusu (2010), but there seem to be social implications associated with this problem. He discusses several social implications that occur as a result of inadequate waste management in his paper. The stigmatization of societies that are marked by inadequate waste management is one of the social consequences. Taking Tema Newtown into account, one would say that the city is underdeveloped and that its failure to contribute to the area's waste management and the collection has contributed to the stigmatization of the city. It makes it difficult for the Assembly, therefore, to assist them in their growth ventures. As compared to Tema Newtown, different communities in Tema are well-formed and organized.

Furthermore, the atmosphere is the arena for societal standards and legislation regulating practices and behaviors that are enhanced and repeated through the replication of such daily events involving individuals (Pellow, 2012). Bad living conditions, in fact, have far-reaching consequences for children and teenagers since

they are more susceptible to a variety of environmental issues than adults and are more prone to be influenced in ways with longer-term effects (Bartlett, 2009). Children are able to learn by observation, according to the social learning theory of Bandura, and begin to mimic the behaviour of people they consider important individuals (Bandura, 1977, as cited by Cherry Kendra, 2013).

Parents and older adults are considered to be benchmarks for assessing good values or behaviour in most parts of the African countries (Owusu, 2010). It is unlikely that the young people and children in the group will behave differently from their older community members who wax in a trash environment and bad health practices (Owusu, 2010). Part of this can be due to young people's undisciplined behaviour, their lack of knowledge of good health practices.

They become uncontrollable and can contribute to deviant behaviour as these learned behaviour patterns evolve over time. This occurs when, as described by Travis Hirschi's Social Control Theory (Ashley Crossman, 2012), the social links that bind an individual to a specific social group are weakened. Thus, as they know, there is no strict commitment to that specific value or circumstance; the attachment of people to their societies can be broken. As far as waste management is concerned, we may conclude that the mechanisms that regulate waste management in communities are inadequate and lead in part to the undisciplined conduct of indiscriminately dumping refuse at an unauthorized site. The imbalances between cultural goals and structurally accessible means of achieving this objective will further clarify this effect and lead people to deviant behaviour (Ashley Crossman, 2012). The means to achieve better well-paid jobs are not available in this unique situation, and so individuals become upset and irritated by the demand for payment for garbage collection or waste management.

2.2.13 Empirical Review

2.2.13.1 Readiness of Restaurants to Reduce, Reuse and Recycle Solid Waste

Restaurants use significant renewable materials, remove huge quantities of raw and solid waste and impact the health of the natural environment under which they are constructed and work, according to an Ustad study (2010). Globally, the restaurants industry has embarked on a journey to implement sustainable measures or a very systematic approach named environmental management systems (EMS) to mitigate harmful impacts on the climate, an advancement that has been profoundly fostered to give its adopters additional benefits. Greening is scarcely explored in the New Zealand restaurants industry, among the numerous environmental concerns that have been discussed. The study sought to achieve four key objectives in order to understand better the environmental activities of the New Zealand accommodation sector: to assess the knowledge of the environmental management system (EMS) by New Zealand restaurants managers; to define sustainability programs implemented in New Zealand restaurants; to explore the perception by restaurants managers of the benefits associated with adobe management.

The researcher used a quantitative survey approach to achieve the objectives of this report, in which environmental management systems were investigated in the New Zealand accommodation market. The data was collected through a postal questionnaire distributed to 41 restaurants that agreed to participate in the report, of which 36 restaurants participated in the completion of the survey. In particular, this study included 94 restaurants managers, representing 36 restaurants from different parts of New Zealand.

Environmental practices, understanding of EMS, motivations (motives), benefits and constraints for EMS adoption and implementation were the primary issues examined in this report. Restaurants participating in this study have shown greater participation in electricity, water and waste management activities than restaurants studied in different geographical areas through previous studies. Furthermore, it was noted that Restaurant managers in New Zealand have a limited fundamental understanding of the term EMS, and this may mean that EMS is actually not commonly used as a management tool, but rather as an approach or structure for the implementation of environmental practices. The study presented some of the first practical proof of the potential advantage of New Zealand Restaurants managers and obstacles to implementing EMS. In New Zealand, managers displayed a greater devotion to environmental protection and conservation and suggested that it was the biggest motivator for EMS implementation. However, comparable advantages were found in the study compared to previous studies in which marketing and cost-saving opportunities were highly recognized. The study identified two key obstacles to EMS implementation. These challenges are the expense of implementation and the absence of enabling technology. Indeed, it was interesting that the lack of human resources and no possible benefits were listed as a less significant EMS obstacle.

Zhou (2007) attempted to decide what SWM programs have been introduced in the operations of college and university food services and to determine how the behaviours, subjective expectations, and challenges of NACUFS members influence the implementation of additional SWM programs based on the Theory of Expected Action (TPB). A secondary objective was to define the variations in the purpose of implementing sustainable waste management programs based on the characteristics of

the age of the respondents, the size of the facility, the area of the country and whether the facility had a committee on sustainable waste management.

In this analysis, 2,184 members of NACUFS whose e-mail addresses are identified in the membership directory of NACUFS were selected as participants. Using SPSS version 17.0.0, the data was analyzed. The theories and study questions were evaluated using multiple linear regression analysis, T-tests, and ANOVA. At p=0.05, statistical significance was set. The total number of answers was 212, resulting in a response rate of 13.5 percent. SWM systems that do not need major resources have been adopted by the majority of respondents. NACUFS members had positive attitudes about implementing an SWM program, and it was necessary to consider others when implementing an SWM program for their colleagues, university administrators, and student opinions. The only demographic that greatly affected the intentions of NACUFS members to adopt an SWM program was whether a college and university foodservice had a sustainability committee.

Overall, the only important predictors of intent to adopt an SWM program were attitude and subjective norms (p=.05). Therefore, if NACFUS participants have a strong sustainability mindset, significant others around them who agree and inside the operation, there is a sustainability committee, they are more likely to adopt an SWM program.

Puopiel's study on ensuring a healthy environment in the Tamale Metropolis (2010). It evaluated the fundamental factors impacting effective solid waste management, and suggested alternative solutions to resolve the issue. Analysis obtained data from two major sources: secondary and original. Preliminary field assessments, questionnaires and face-to-face interviews are three main methods of primary knowledge gathering. As factors affecting successful solid waste management in

Metropolis, the following main findings were reported. Insufficient availability of waste disposal equipment; insufficient regular waste collection practices; inefficient waste treatment practices; and insufficient resource for efficient waste collection institutions. In view of the above-mentioned problems, the report suggested sufficient availability of skips, regular waste disposal, utilizing the ISWM model, proper waste management and suitable waste management institutes.

Managing solid waste is among the major problems facing most countries all over the world, according to Yeboah (2017). Long before public attention was paid to water and air quality issues, solid waste was already a problem. Managing solid waste is a major global economic and environmental issue. Due to the heroic nature of the resource and technological role of waste management, policymakers have adopted the PPP as the solution to solid waste management. The study focused on a public-private disposal arrangement in the Municipality of Sunyani.

The study's main focus was to challenge administrative frameworks for a public-private relationship in Sunyani Municipality. The research took a qualitative approach to the target, interviewing 32 participants utilizing semi-structured interviewing and non-participant observation. The information gathered in the themes was examined and interpreted. The analysis finds poor Sunyani Municipality's administrative PPP framework.

However, it was founded that urban solid waste management was guided by the Assembly's national environmental health and by-laws. The study showed that while the private partner had certain money, they were not adequate to manage solid waste in the Sunyani Municipality under the PPP arrangement. To direct the organization of the PPP, the study proposes improving administrative mechanisms such as supervision, sanctioning bad performance, and drafting assembly by-laws.

Restaurants are, by and large, measured by their level of environmental performance rather than their financial performance, according to Amankwaa (2012). Restaurants management is driven to pursue acceptable, sustainable practices as a result of competition and unrestrained pressure from consumers, regulatory bodies, investors and other stakeholders. The foreign visibility of Golden Tulip Kumasi City was chosen as a case study to help achieve the key research goals. In order to formulate the standards and environmental management systems for the sector, an extensive and comprehensive literature on the ISO 14000 Standard was also reviewed.

The research sought to define, in tandem with the design of an Environmental Management Programme and recommendations according to the ISO 14001 Standard, the particular environmental aspects and their respective environmental impacts. The findings show that some of the amenities, events and services offered by the restaurants, such as air conditioning, laundry and kitchens, have a major effect on the climate. Among these impacts, the waste and disposal of unsorted waste, steam and chemical vapours emitted into the air and soil and water pollution have increased. There is, therefore, a serious need for proper environmental management practices in the hospitality sector to be implemented. To sum up, the hospitality industry in Ghana does not have any guidelines for the effective implementation of the ISO 14001 Standard EMS. It is also strongly recommended that they follow a standard for enhancing their environmental efficiency.

Addy (2013) clarifies that waste collection and disposal threaten the development of Ghana's cities and cities. Day by day, piles of waste are uncollected in city centers and houses. Tons of waste spreads across streets and gutters and the effects are immense, particularly as a result of rapid urbanization. Inundation and the spread of diseases are part of the consequences, the aesthetic value of the environment, among

others, as a result of cross-contamination. With such challenges associated with waste generation, the city of Tema is a fast-urbanizing place.

Therefore, this research sought to determine the effects of uncollected household waste produced in a community within the Tema Metropolitan Area in Tema Newtown. A sample of 120 households, main informant interviews of officials within Tema's administrative and conventional authority and observations were used in the study to achieve its objectives. In addition, the Contingent Valuation Approach has been used to evoke and evaluate the willingness of respondents to pay.

Results of the analysis showed that 3.8 tons remained uncollected from 11.64 tons of waste generated daily in Tema Newtown. Testing also revealed that the respondents were conscious but unconcerned about the uncollected problem. However, they were mindful of the consequences of the waste created and what was left uncollected, including severe pollution, erosion, water body contamination, and city devaluation due to the odor in certain city areas. Most respondents are willing to pay a premium for a superior, improved waste management scheme based on the valuation performance. Therefore, the report encourages the implementation of a Public-Private Relationship and recycling of waste products in multiple forms to reduce the rate of uncollected waste and productive waste management.

Nshimiyimana (2015) used a case analysis of the Nyarugenge District in Kigali, Rwanda's capital, to investigate the administration of urban solid waste management operations. This research was inspired by three specific aims, namely assessing the status of existing Nyarugenge District solid waste processing, transportation and disposal activities; evaluating the severity of solid waste management issues; and designing solutions to solve waste management problems in Nyarugenge District.

For this analysis, a case study of research design was used in which this research was told by a total of 381 respondents. These were obtained by purposeful and random sampling. During the collection of primary data, observation, questionnaires and interviews were used. The knowledge was quantitatively and qualitatively analyzed. According to the findings of the study, individuals in the district of Nyarugenge use different methods for gathering, transporting and later disposing of solid waste at a recognized location. It was found that the work of private firms under the municipality's jurisdiction is solid waste management. It found that materials such as sacks were used to collect solid waste in due course.

The study concludes that solid waste management and collection is never a responsibility of either one person or one organization; rather, all the groups and individuals at hand. There is, therefore, a need for all individuals to strive for a cleaner world and a better life. The study also calls on various groups and organisations in the Nyarugenge District to apply modern techniques for collecting, transporting and disposing of solid waste.

Ebrahiem (2015) suggests that several factors contribute to the rate of growth globally in municipal waste generation, with local factors characterized by increasing population, growth, fast urbanization and an increasing standard of livelihood. Malaysian urban waste is rising rapidly because of the impact of these variables. In all sectors producing this waste, this strengthens the increasingly desired waste management activity. As one of the main waste sources worldwide and in Malaysia, restaurants have a credible share of municipal waste, increasing the need in restaurants to investigate waste management practices. The aim of this study is to study waste management practices in restaurants in the town of Petaling Jaya in respect of

enforcement and waste management knowledge and the inclusion of such findings in waste management practice.

Two approaches were used for the study; the first technique was a survey of restaurants' conformity with the 1976 Local Government Act (LGA), undertaken by academics. The second approach was accomplished by a questionnaire through informal interview with the researcher. Petaling Jaya City Council suggested the SS2 district to be the region's most compliant. E-checklists prepared by the Burbank Sustainability Alliance's Green Restaurant Checklist, January 2009, and the Green Company Initiative's Additional Checklist for Restaurant and Food Services, February 2010 analyzed perception and waste management activities. Depending on the interview, perception and waste management activities were done by changing the checklists into questionnaires.

By analyzing the closed-ended questions and answers, the data from this analysis were analyzed manually, and then the cumulative result from various sections of the study was found. The compliance study is intended to test restaurant operators' adherence to the 1976 Local Government Act, which finds 93% enforcement among the restaurants surveyed. The awareness research on waste management aims to find out the extent of understanding of aspects of waste management by restaurant operators.

The overall outcome of the waste management perception analysis was 21 percent. The practice of waste management transforms restaurant operators' understanding of good waste management efficiency. The overall waste management performance in the study was 66 percent. The consequence of the practice of waste management, therefore comes as an attempt to motivate the Act, which provides high enforcement for restaurant operators.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

This study was designed as a descriptive research design in making a quantitative inquiry to examine solid waste management practices in the foodservice industry of restaurants in Sunyani Municipality. In particular, the design of descriptive cross-sectional research for this study has been adopted. The descriptive research design describes, observes and assesses a phenomenon as it is without manipulation of any variable and the cross-sectional descriptive research studies a population within a specific period of time (Gay, Mills & Airasian, 2009). The approach helped to quantify data that was collected on the classifications/categories of solid waste generated by restaurants; the level of readiness of restaurants to reduce, reuse and recycle solid waste; waste management strategic action plan for sustainable development of restaurants; and the effectiveness of environmental management policies and practices of solid waste management in restaurants.

The study a adopted a quantitative research strategy/approach. Quantitative research is a research strategy aimed at quantifying data gathering and analysis (Gay, Mills, & Airasian, 2009). In the context of this study, the quantitative strategy/approach helped to quantify data that was collected on the classifications/categories of solid waste generated by restaurants in the Sunyani Municipality of Ghana

3.3 Study Area

Sunyani is the Bono region's administrative capital. Sunyani Municipal has a population of 123,224 in 2010, representing 5.3% of the city's total population, according to the 2010 Population and Housing Census. The men represent 49,9% of

the population and the women account for 50,1%. Around 80% of the population are urban (83.1). The overall addiction ratio of the municipality is 54.0; the male addiction ratio is higher (54.4) than that of women (53.62).

About 62.0% are economically active and about 38.1% of people aged 15 and older do not actively engage. 93.2% of the working population is employed, while the unemployed make up 6.8%. More students are (75.4%), 10.7% perform household tasks and 2.1% are disabled or too ill for other people who do not have economic involvement. Six of ten unemployed people are looking for employment for the first time. Figure 3.1 shows a map of Ghana's Sunyani Municipality.

Figure 3.1: Map of Sunyani Municipality
Source: Ghana Statistical Service (GIS), 2019

The Sunyani Municipal Assembly covers a total land area of 506.7 Km^2. It is lying between Latitudes 7^o 20'N and 7^o 05'N and Longitudes 2^o30'W and 2^o10'W. It is bordered on the north by Sunyani West District; west by Dormaa East District south by Asutifi District to the South and east by Tano North District.

3.4 Population

The population for the study comprised all managers and staff/employees in the food service industry of the restaurants in the Sunyani Municipality. There were 110 restaurants, with a population of 110 managers/supervisors and 677 employees totaling 787 respondents (Sunyani Municipal Assembly, 2020).

Staff or employees were involved in the study because they were in a better position to provide information on the classifications/categories of solid waste generated by restaurants; the level of readiness of restaurants to reduce, reuse and recycle solid waste; waste management strategic action plan for sustainable development of restaurants. Managers and supervisors could also provide information on the level of readiness of restaurants to reduce, reuse and recycle solid waste; waste management strategic action plan for sustainable development of restaurants; and the effectiveness of environmental management policies and practices of solid waste management in restaurants in the Sunyani Municipality.

3.5 Sample Size and Sampling Procedures

A sample size is basically the subset of the actual number of individuals of the population. It has been confirmed by some scholars in Social Science that for a sample to be representative in a study, it must be a good proportion of the population (Welman, Kruger, & Mitchell, 2005; Zikmund, 1994). Using Krejcie & Morgan (as cited in

Sarantakos, 1997) the table for determining sample size from a given population, 86 managers/supervisors and 245 staff/ employees totaling 331 respondents from the foodservice industry in the Sunyani Municipality were selected for the study. This constituted the sample size for the study.

The convenience sampling procedure was used to select restaurant from the foodservice industries and their staff for the study. Convenience is to select the most proximate and available persons to serve as interviewees and to continue the process up to the necessary sample size when this method of sampling were used, all the respondents that were accidentally chanced upon during a certain period of time are considered. Using this sampling technique, the study involved restaurants that were nearest and available to the researcher because some of the restaurants were still not operating due to the Corona Virus pandemic. One (1) manager and two (2) employees from each food service industry of restaurants who were available at the time of data collection were involved in the study. This was done until all the 331 managers and employees were obtained.

3.6 Research Instruments

The Data Collection Instrument is a tool used by researchers in social science research for data collection (Bhandarkar & Wilkinson, 2010). It relates not only to the design, collection, construction, and evaluation of data collection instruments but also to the conditions under which the instruments designated are administered (Hsu & Sandford, 2010). The key instrument used for the collection of data was the questionnaire. A questionnaire is a form prepared and distributed to secure answers to certain questions, Deng (2010). It is a systematic collection of questions from which knowledge is desired that is sent to a sampling population. As to why the questionnaire

was used, if the sample size is broad enough to interview any topic in the study for purposes of time or funds (Osuala, 2005), it is beneficial. The study used a questionnaire created by itself that was structured to answer each of the research questions. On the five-point Likert scale, the questionnaires for the respondents were (1= Strongly Disagree (SD); 2= Disagree (D); 3= Uncertain (U); 4= Agree (A); 5= Strongly Agree (SA).

The employees' questionnaire consisted of 40 items in four parts (A, B, C, and D). Part A included four (4) items aimed at collecting information on the respondent's demographic characteristics. Section B consisted of fourteen (14) items which were intended to obtain information on waste classification. Section C had fifteen (15) items that looked at restaurants' readiness to decrease, reuse and recycle solid waste. Again, section D consisted of seven (7) items addressing the Strategic Action Plan on Waste Management for Sustainable Restaurants and Restaurant Growth.

The managers' questionnaire composed of 51 elements in five parts (A, B, C, D, and E). The A segment included four (4) things aimed at collecting details on respondents' population characteristics. Section B consisted of 14 (14) objects to gain details on waste classification. Section C has 15 products, which explored the supply of restaurants for solid waste to be minimized, re-used and recycled. Section D again consisted of seven (7) elements that looked at the Strategic Restaurant Action Plan on Waste Management. Section E consisted of 11 things which considered the effectiveness of restaurant environmental management policies and practices.

3.6.1 Validity and Reliability of Instruments

A validity and reliability test were performed on the testing instrument. To determine how they met face and content validity, the instruments were given to my supervisor. The supervisor's recommendations were used to make the required

adjustments to develop the instrument. A pilot test of the tools was subsequently performed, administering the questionnaires in fifteen (15) foodservice industry of restaurants in the Kumasi Metropolis. This is because the restaurants management practices implemented in the foodservice industry of restaurants in the area are similar to what pertains in the Sunyani Municipality. Also, the restaurants in the Kumasi Metropolis are confronted with similar challenges compared with those in the Sunyani Municipality in terms of the classifications/categories of solid waste generated by restaurants; the level of readiness of restaurants to reduce, reuse and recycle solid waste; as well as waste management strategic action plan for sustainable development of restaurants in the Sunyani Municipality.

The questionnaire for the employees consisted of four (4) sections, i.e., sections A, B, C, and D covering various relevant areas such as demographic information; classification of solid waste; readiness of restaurants to reduce, reuse and recycle solid waste; as well as waste management strategic action plan for sustainable development of restaurants. The homogeneity values (Cronbach's alpha) of the scales vary between .73 and .89. Cronbach's alpha of .86 was obtained for the employees' questionnaire. The 5 sections cover the following areas: demographic information (items no. 1, 2, 3, 4; Cronbach`s alpha 0.72). This area covers background information such as gender, age, years of working experience and educational level. Section B (items no. 5, 6, 7, 8, 9, 10, 11; 12; 13; 14; 15; 16; 17; 18; Cronbach's alpha 0.86) included the classification of solid waste. Section C (Items no. 19, 20, 21; 22; 23; 24; 25; 26; 27; 28; 29; 30; 31; 32; 33; Cronbach's alpha 0.89) consisted readiness of restaurants to reduce, reuse, and recycle solid waste. Section D (items no. 34; 35; 36; 37; 38; 39; 40; Cronbach's alpha 0.81): This section covered waste management strategic action plan for sustainable development of restaurants.

Similarly, the questionnaire for the managers consisted of five (5) sections, i.e., sections A, B, C, D, and E covering various relevant areas such as demographic information; classification of solid waste; readiness of restaurants to reduce, reuse and recycle solid waste; waste management strategic action plan for sustainable development of restaurants; as well as the effectiveness of environmental management policies and practices of solid waste management in restaurants. The homogeneity values (Cronbach`s alpha) of the scales vary between .72 and .91. Cronbach's alpha of .91 was obtained for the managers' questionnaire. The 5 sections cover the following areas: demographic information (items no. 1, 2, 3; 4; Cronbach`s alpha 0.72). This area covers background information such as gender, age, years of working experience, and educational level. Section B (items no. 5; 6; 7; 8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; Cronbach`s alpha 0.89) included classification of solid waste. Section C (Items no. 19, 20; 21; 22; 23; 24; 25; 26; 27; 28; 29; 30; 31; 32; 33; Cronbach`s alpha 0.91) consisted the readiness of restaurants to reduce, reuse, and recycle solid waste. Section D (items no. 34, 35, 36, 37, 38, 39, 40; Cronbach`s alpha 0.86): This section covered waste management strategic action plan for sustainable development of restaurants. Finally, Section E (items no. 41, 42, 43, 44, 45, 46, 47, 48; 49; 50; 51; Cronbach`s alpha 0.79) included the effectiveness of environmental management policies and practices of solid waste management in restaurants. The questions that came from the study of the products were answered. Both of these steps were taken to ensure that the instruments were able to obtain quality and usable data for the analysis.

3.7 Data Collection Procedure

The instruments were self-administered to ensure a high response rate. The researcher provided the managers and staff/employees who served as study respondents with copies of an introductory letter from the head of the department before data

collection. The aim of this introductory letter was to request cooperation and also to build relationships between the researcher and the managers, as well as the study respondents. The respondents were briefed and supervised by the researcher to complete the questionnaire as to how to respond to the objects. It took four weeks for the entire data collection exercise.

3.8 Data Processing and Analysis

This study sought to examine solid waste management practices in the foodservice industry of restaurants in Sunyani Municipality. Descriptive statistics were employed in the review of the data to address the research questions formulated to direct the study. Specifically, percentages, frequencies, means and standard deviations were used to analyze the questionnaire items on the background characteristics/ demographics of the respondents as well as research questions 1-4.

3.9 Ethical Considerations

Before the commencement of the study, an informed consent form detailing the researcher's background, contact information, the purpose of the study, procedures, confidentiality, voluntary participation, and right to withdraw in the study was given to participants and respondents to read. Upon agreement to participate in the study, research participants were asked to sign the forms. Research participants were also informed that they could choose not to answer any questions they felt uncomfortable with. Participants were made to understand that participation in the study was voluntary, and they could withdraw from the study at any time without attracting any consequence. The researcher ensured that participants' privacy was respected and ensured their anonymity. Data collected for the study was kept confidential and used solely for the purpose indicated.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

The aim of this study was to examine solid waste management practices in the restaurants and restaurant foodservice industry in Ghana's Sunyani Municipality. To collect the necessary data for the analysis, two sets of questionnaires (for workers and managers) were used. Data obtained from employees and executives were analyzed through the measurement of frequencies, percentages and mean distributions of means. From the total of 331 questionnaires distributed, 331 valid responses were retrieved, representing 82.75% response rate. The response rate was considered enough to support any conclusions drawn from the data. The data analysis employed both descriptive. The interpretations, discussions and inferences made from the results are described in this chapter.

4.1 Demographic Characteristics of Respondents

Table 4.1 shows the demographic characteristics of respondents in the foodservice industry in the Sunyani Municipality of Ghana.

Table 4.1: Demographic characteristics of respondents

Variable	Designation		Total
	Staff	Managers	
Gender			
Male	94 (38.4%)	49 (57.0%)	143 (43.2%)
Female	151 (61.6%)	37 (43.0%)	188 (56.8%)
Total	**245 (100%)**	**86 (100%)**	**331 (100.0%)**
Age			
16 – 19 yrs.	14 (5.7%)	0 (0%)	14 (4.2%)
20 – 29 yrs.	70 (28.6%)	0 (0%)	70 (21.1%)
30 – 39 yrs.	106 (43.3%)	23 (26.7%)	129 (39.0%)
40 – 49 yrs.	38 (15.5%)	32 (37.2%)	70 (21.1%)
50 – 59 yrs.	13 (5.3%)	20 (23.3%)	33 (10.0%)
60 – 69 yrs.	4 (1.6%)	11 (12.8%)	15 (4.5%)
Total	**245 (100%)**	**86 (100%)**	**331 (100.0%)**
Years of working experience			
1 – 5 yrs.	58 (23.7%)	17 (19.8%)	75 (22.7%)
6 – 10 yrs.	80 (32.7%)	23 (26.7%)	103 (31.1%)
11 – 15 yrs.	49 (20.0%)	20 (23.3%)	69 (20.8%)
16 – 20 yrs.	33 (13.5%)	17 (19.8%)	50 (15.1%)
Above 20 yrs.	25 (10.2%)	9 (10.5%)	34 (10.3%)
Total	**245 (100%)**	**86 (100%)**	**331 (100.0%)**
Educational level			
No formal education	81 (33.1%)	13 (15.1%)	94 (28.4%)
JHS	126 (51.4%)	23 (26.7%)	149 (45%)
SHS	38 (15.5%)	23 (26.7%)	61 (18.4%)
Tertiary	0 (0%)	27 (31.4%)	27 (8.2%)
Total	**245 (100%)**	**86 (100%)**	**331 (100.0%)**

From Table 4.1, out of the 331 staff and managers who were involved in the study, 143 (43.2%) were males, whiles 188 (56.8%) were females which indicate that the majority were females. It is worth noting that the majority of the males were in managerial positions, whereas the majority of the females were in the staff positions. This implies that men are mostly entrusted with the weightier roles of managing the entire outfits whereas the women take care of the day

However, concerning respondent's age, the majority (n=129, 39%) of the respondents were between the ages of 30 – 39 years whereas 70 (21.1%) also indicated they were aged between 20 – 29 years and 40 – 49 years respectively. It could further be observed that the majority of the managers were between the ages of 30 – 59 years, whereas for staff, the average age ranged between 20 – 49 years.

Moreover, results on the working experience of respondents showed that the majority (n=103, 31%) of the respondents have had between 6 – 10 years of working experiences in the hospitality industry. Additionally, 75, representing 22.7% also indicated they have been working in the industry for 1 – 5 years.

Concerning the level of education of the respondents, the results show that close to half (n=149, 45%) of the respondents were Junior High School leavers whereas 94 representing 28.4% of the respondents had no formal education. It is worth mentioning that, relative to workers, most administrators have tertiary qualification as their highest education standard.

4.2 Categories of Solid Wastes Generated by Restaurants

This research objective sought to classify the solid waste generated by restaurants in the Sunyani Municipality. It is important that managers and staff in the food industry of restaurants share their views on the categories of solid waste that they generate so that appropriate measures can be put in place. Table 4.2 presents the views of respondents concerning the general classifications of waste as generated in the course of their production activities.

Table 4.2: Type of waste generated

Type of waste	N	Minimum	Maximum	Mean	±SD
Solid		4	5	4.70	.460
Liquid		5	5	5.00	.000
Gas		2	5	3.10	1.001
Valid N (listwise)	331				

Table 4.2 shows the descriptive statistics of respondents' views on the type of unwanted substance or unusable material they usually discard. This was measured on the scale of 1- never, 2-rarely, 3-sometimes, 4-often, and 5-very often. Summary of the results shows the majority of the respondents indicated that liquid waste (M=5.00), solid (M=4.63, ±SD=.483) and gas (M=3.31, ±SD=1.029) are generated very often in the course of their productive activities. Freduah (2014) it describes that if it is no longer valuable to the owner or is used and does not serve its function, everything will become waste.

Table 4.3: Daily Volume of solid waste generated by restaurants

N	Minimum	Maximum	Mean	±SD
331	1	5	2.99	1.418

In table 4.3, the respondents were requested to estimate the quantity of waste generated in the day. Analysis of the responses show that the quantity of solid waste collected was categorized as follows: 1=1 – 230 kg, 2=240 – 470 kg, 3=480 – 690 kg, 4= 690 – 920 kg, 5=930 – 1100 kg and 6=quantities more than 1100 kg. Considering the mean score of 3.00 gives a clear indication that the majority of the respondents agreed to generating between 480 – 690 kg of solid waste in the course of the day's food production activities. The results corroborate the works of Cohen (2016) estimated

the production of solid waste from sources in the economy and found that the hospitality industry generated an average of 400 – 600kg of waste in a given day. However, Chan & Lam (2011) observed that many local restaurants have very little interest in reducing or recycling waste, arguing that such operations are too costly as well as time-consuming.

Table 4.4: The quantity of various types of solid wastes that are generated from the selected restaurants on a daily Basis

Days	Paper Kg	Glass kg	Plastic kg	Metals Kg	Food Kg	Total kg
Monday	137	150	259	150	209	905
Tuesday	250	250	300	200	270	1270
Wednesday	200	300	450	250	280	1480
Thursday	190	320	280	350	290	1430
Friday	220	220	260	450	300	1450
Saturday	290	550	420	450	360	2070
Sunday	240	350	120	350	320	1380
Total	1527	2140	2089	2200	2029	9985

Table 4.4 it was observed that 2200 kg of metal waste was generated in a weekly basis, and this was followed by glass with 2140 kg, plastic 2089 kg, food items 2029 kg and paper 1527 kg as the various types of solid waste that are generated from the selected foodservice industries of restaurants. This implies that the quantities of solid wastes that are generated from the foodservice industries of restaurants were quite high. Therefore, there is a need to ensure the proper management of solid waste in order to protect our environment.

From the foregoing, it can be concluded that waste was generated in the foodservice industry of restaurants in the course of their activities. Solid and liquid wastes were generated very often in the course of their activities, but gaseous wastes

were sometimes or rarely generated. However, although employees indicated that, separate bins were not provided to sort out the types of solid waste (e.g., glass, paper, plastic, and rubber), the managers indicated that separate bins were provided to sort out solid wastes. Also, rubbish, food waste, and trash were the forms of solid wastes that were generated in the foodservice industry of restaurants. Again, it was observed that 2200 kg of metals was generated in a weekly basis, and this was followed by glass with 2140 kg, plastic 2089 kg, food items 2029 kg and paper 1527 kg as the various types of solid waste that are generated from the selected foodservice industries of restaurants. This implies that the quantities of solid wastes that are generated from the foodservice industries of restaurants were quite high.

4.2.1 Provision of Separate Bins to Sort out the types of solid Waste

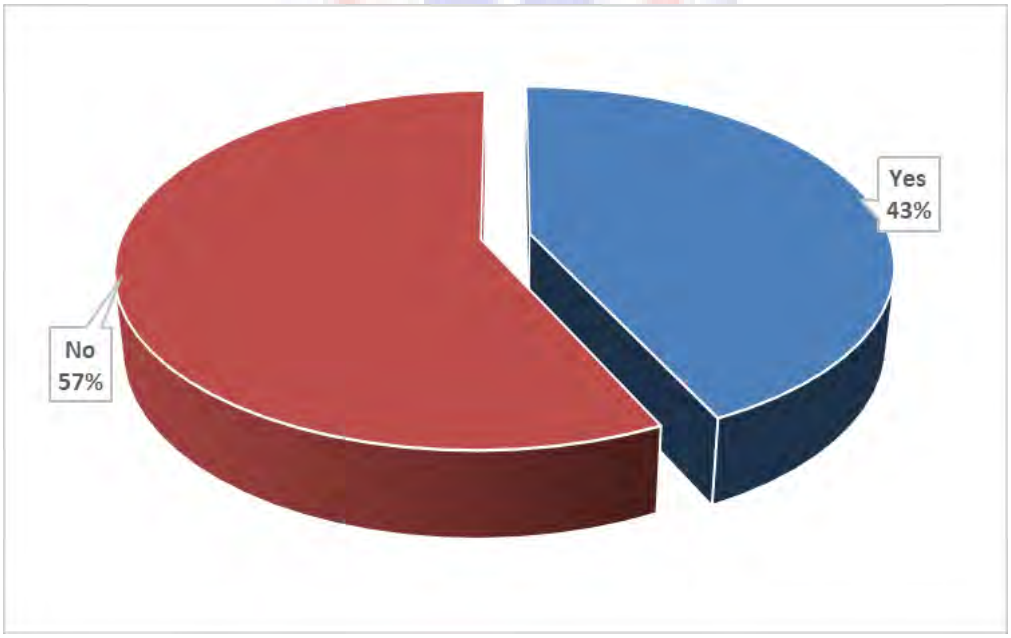

Figure 4.1: Provision of separate bins to sort out the types of solid waste

Figure 4.1 presents the responses when the respondents were asked whether they provided separate bins for the separation of solid waste in their respective businesses. The results show that the majority of respondents, 57% said 'No' to

providing separate bins to sort outsold waste. On the contrary, 43% noted that separate bins were made available to sort out types of solid waste as and when generated. Contrary to the position of Tchobanoglous et al., (2013) who asserted that waste separation operations need to be planned in an effort to extract useful resources from the mixed solid waste.

Table 4.5: Categorization of solid waste

Type of waste	Frequency (n)	Percent (%)
Glass	84	25.38
Paper	83	25.08
Plastic/Rubber	164	49.55
Total	331	100.00

In Table 4.5, respondents comprising both staff and management were asked to indicate the various forms of classifications that are done to the waste generated from their activities. The responses as being shown in the table suggest that almost half (n=164, 49.5%) of the respondents indicated solid waste are sorted more into plastic or rubber, glass and paper waste that is generated in their production.

Table 4.6: Descriptive statistics on the types of waste discarded

Types of waste generated	N	Min	Max	Mean	±SD
Rubbish (e.g., combustible rubbish, i.e., paper, cardboard, garden trimmings, plastics, textiles, rubber, leather, timber, furniture. Non-combustible waste, i.e., Glass, tin, aluminum, ferrous metals and dirt, ashes).		1	1	1.00	.000
Food waste (i.e., In gardens, restaurants and cafeterias, uneaten portions of meals and trimmings from food processing practices).		1	1	1.00	.000
Trash (rubble concrete and waste parts, installations and repairs, washbasins, sinks, bathtubs, plumbing components, parts for cars or vans, batteries for engines, equipment, tree, logs and branches with a diameter reaching 6 inches and tree stumps).		1	2	1.40	.491
Special waste (street waste, animals and abandoned vehicles, litter from the roadside, litter from municipal containers and bin debris).		1	2	1.54	.500
Hazardous waste (i.e., toxic, flammable, corrosive, radioactive, explosive and other dangerous materials).		1	2	1.90	.303
Valid N (listwise)	331				

Table 4.6 gives a representation of respondents' views on the types of waste discarded by the respondents. This was measured on the scale of 1=yes and 2=no. Analysis of the responses suggests shows that the majority of the respondents said Yes to discarding rubbish such as combustible rubbish (M=1.00, ±SD=.000) which is made up of combustible rubbish and non-combustible rubbish. In addition, the results showed that the majority of the respondents responded 'Yes' to discarding food waste (i.e., in gardens, restaurants and cafeterias, uneaten portions of meals and trimmings from food processing practices) (M=1.00, ±SD=.000), and trash (rubble concrete and waste parts, Facilities and maintenance, drains, showers, kitchens, plumbing components, car or

tractor parts, vehicle motors, engines, tree, trees and branches exceeding 6 inches in diameter and tree stumps) (M=1.40; ±SD=.491).

On the contrary, majority of the respondents said no to ashes (M=1.85; ±SD=.359), special waste (street waste, animals and abandoned vehicles, litter from the roadside, litter from municipal containers and bin debris) (M=1.54, ±SD=.500) and hazardous waste (i.e., toxic, flammable, corrosive, radioactive, explosive and other dangerous materials) (M=1.90, ±SD=.303). This suggests that most of the firms discarded rubbish such as plastics, textiles, rubber etc., food waste such as uneaten portions of cans, aluminium cans etc. and trash.

From the results, it can be concluded that Trash, Rubbish and food waste remains the main solid waste that is discarded by restaurants and restaurant operators in the Sunyani municipality. The results further implied that restaurants and restaurants surveyed do not generate hazardous waste in their outfit. The findings are supported by the US EPA (2008) observations, which stated that toxic waste may be liquids, solids, gases, or sludge and can be by-products of industrial operations or simply expired consumer products such as fluid cleaning or pesticides. Additionally, Miller (2014) and Kreith (2014) pointed out that in kitchens, restaurants and cafeterias, food waste requires unconsumed portions of meals and trimmings from food preparation practices. In the light of the results, it is conceivable to believe that all those food wastes that are generated from the unconsumed portions of meals and trimmings from food preparations should be traded off to firms or individuals in the animal husbandry business.

Arguably it is imperative to note that the non-generation of hazardous waste from the industry stems from the scope of the business itself. Food-related businesses, by and large, have no significant association with the acquisition and utilization of

radioactive, explosive, toxic and flammable substances worthy of producing hazardous substances into the environment. This finding is in sync with the position of EGSSAA (2009), who asserted that hazardous wastes are especially difficult to manage given the range and groups of materials and sources they are acquired from.

Table 4.7: Descriptive Statistics on the readiness of restaurants to reduce, reuse and recycle solid waste

Statements	N	Min	Max	Mean	±SD
This Restaurants is ready to introduce a solid waste diversion policy so it will generate substantial cost reductions in waste transportation fees.		1	5	3.81	.747
This restaurant serves a proper portion of food to reduce waste.		4	5	4.80	.398
This Restaurant adopts a paperless policy, including the use of electronic software or systems (e.g., E-copy) in order to reduce waste.		1	5	1.89	1.602
This restaurant reduces solid waste by avoiding over preparation.		1	5	3.78	.682
Valid N (listwise)	331				

Table 4.7 shows respondents' perceptions on restaurants readiness to reduce, reuse and recycle solid waste. This was measured using the five-point Likert scale of 1-strongly disagree, 2-disagree, 3-uncertain, 4-agree and 5-strongly agree.

From the results, it could be observed that the majority of the respondents agreed that their restaurants is ready to implement solid waste reduction programme because it can create significant cost savings in waste hauling fees (M=3.81, ±SD=.747) and serve a proper portion of food to reduce waste (M=4.80, ±SD=.398). Moreover, majority of the respondents also agreed that their restaurants reduce solid waste b avoiding over-preparation (M=3.78, ±SD=.682).

On the contrary, the majority of the respondents disagreed that their restaurant adopts a paperless policy, including the use of electronic software or systems in order to reduce waste (M=1.89, ±SD=1.602). From the results it can be concluded that the restaurants in the foodservice industry are ready to implement solid waste reduction programme because it can create significant cost savings in waste hauling fees, restaurant serves a proper portion of food to reduce waste and also reduces solid waste by avoiding over preparation. On the contrary, the responses suggest that restaurants adopt a paperless policy, including the use of electronic software or systems (e.g., E-copy) in order to reduce waste. This implies that most of the restaurants did not use paperless systems (electronic software) to reduce waste in as much as they were ready to implement solid waste reduction programmes, avoiding over preparation and also serving proper portion of food.

Table 4.8: Descriptive statistics on respondent's views on reusing of waste

Statements	N	Min	Max	Mean	±SD
This restaurant compost spoiled food and leftover plate scrapings into organic materials than trucking them to landfills.		1	5	1.869	1.363
This restaurant donates equipment, furniture and other items for reuse to charity.		3	5	4.13	.487
This restaurant purchases recycled utensils and items (such as refillable pens and pencils, rechargeable batteries, sturdy cups, cutlery, etc.) rather than disposables.		1	5	3.81	.600
This restaurant buys recycled utensils and items (such as refillable pens and pencils, rechargeable batteries, sturdy cups, cutlery, etc.) rather than disposables.	331	1	5	3.03	1.367

With regards to the reusing of generated waste, Table 4.8 presents respondents' views collected on how they used reusing techniques to reduce waste. The responses were measured along a 5-point Likert scale of 1=strongly disagree, 2=disagree, 3=uncertain, 4=agree and 5=strongly agree.

From the table majority of the respondents agreed that their restaurant donates equipment, furniture and other items for reuse to charity (M=4.13, ±SD=.487) and purchased reusable utensils and products (such as refillable pens and pencils, rechargeable batteries, durable cups, cutlery, provides cloth towels as an alternative to paper towels, etc.) rather than disposables (M=3.81, ±SD=.600)

However, most of the respondents were uncertain that restaurants purchased reusable utensils and products (such as refillable pens and pencils, rechargeable batteries, durable cups, cutlery, provides cloth towels as an alternative to paper towels, etc.) rather than disposables (M=3.03; ±SD=1.367) with the majority also disagreeing that restaurants or restaurants compost spoiled food and leftover plate scrapings into organic materials than trucking them to landfills (M=1.86, ±SD=1.363).

The findings indicate that most restaurants contributed charitable supplies, furniture and other objects and often bought recycled utensils and merchandise (such as refillable pens and pencils, rechargeable batteries, sturdy cups, cutlery, as an alternative to paper towels, etc.) rather than disposables as a way of handling solid waste. Restaurants buys recycled utensils and items (such as refillable pens and pencils, rechargeable batteries, sturdy cups, cutlery, as an option to paper towels, etc.) rather than disposables.

Table 4.9: Descriptive statistics on respondent's views on the Recycling of waste

Statements	N	Min	Max	Mean	±SD
This Restaurant repairs solid waste items rather than buy new		3	5	4.16	.485
Additional bins have been provided in order to segregate the recyclable materials		1	4	1.75	1.286
The management of this Restaurant considers recycling (cardboards, papers, cans, plastics, bottles, etc.) as important activities		1	4	1.72	1.285
This Restaurant has little interest in recycling solid waste because such activities are too expensive		1	4	2.84	1.434
This Restaurant tries as much as possible not to contaminate waste food because it is an important role in the waste recycling programme		1	4	1.94	1.391
Recycling solid waste can be time-consuming hence the unpreparedness of this Restaurant to adopt such activities.		3	5	4.09	.429
	331				

Table 4.10 represents the descriptive statistics of respondents' views on recycling methods used for managing solid waste. This was also measured using the five-point Likert scale of 1=strongly disagree, 2=disagree, 3=uncertain, 4=agree and 5=strongly agree.

From the table majority of the respondents agreed that restaurants repair solid waste items rather than buy new (M=4.163, ±SD=.483) and recycling solid waste can be time-consuming restaurants unpreparedness to adopt such activities. However, the majority disagreed that the management of restaurants considers recycling (cardboards, papers, cans, plastics, bottles, etc.) as important activities (M=1.72, ±SD=1.286), additional bins have been provided in order to segregate the recyclable materials (M=1.75, ±SD=1.286) and the Restaurants try as much as possible not to contaminate waste food because it is an important role of the waste recycling programme (M=1.94,

±SD=1.391). Finally, the majority of the respondents were uncertain that restaurants have little interest in recycling solid waste because such activities are too expensive (M=2.84, ±SD=1.434).

From the results, it can be concluded that Restaurant repairs solid waste items rather than buy new and that the Restaurants and restaurant operators do not provide bins to segregate the recyclable materials. Though management of these Restaurants considers recycling (cardboards, papers, cans, plastics, bottles, etc.) as important activities, they showed sufficiently little interest in recycling solid waste because such activities they consider are too expensive. Furthermore, the results have shown that the management of the Restaurants tries as much as possible not to contaminate waste food because it is an important role in the waste recycling programme. Management of the Restaurants and restaurants posited that recycling solid waste can be time-consuming hence the unpreparedness of this Restaurant to adopt such activities. As mentioned in the literature review where Chan and Lam (2011) posited that many local Restaurants have very little interest in waste reduction and/or recycling, arguing that such operations are too costly and time-consuming.

4.3 Waste Management Strategic Action Plan for Sustainable Development of Restaurants

Strategic Action Plan for Sustainable Restaurant Creation in Sunyani Municipality. This study aim was to analyze strategic action plan for sustainable restaurant growth in waste management. The respondents' answers are seen in Table 4.10.

Table 4.10 Strategic waste management action plan for sustainable development for Restaurants

Statements	N	Min	Max	Mean	±SD
A regular monitoring system should be in place to ensure that employees adhere to the solid waste management practices of the Restaurant.		3	5	4.03	.507
Education/Training programmes on solid waste management should be provided for employees so that they can appreciate the need for sustainable development practices.		3	5	4.00	.504
This Restaurant should provide incentives to staff in order to encourage reducing, reusing and recycling solid waste.		4	5	4.53	.500
This Restaurant has a solid waste management suggestion box.		1	4	1.75	1.290
There is a need for reliable data on solid waste generation for this Restaurant.		1	5	4.27	.616
Through the provision of additional bins, solid waste generation could be reused and recycled as much as possible through the composting process and use this fertilizer for home gardening.		1	5	4.34	.624

Table 4.10 shows respondents' views on the restaurants strategic waste management action plan for sustainable development. This was measured on the five-point Likert scale where 1=strongly disagree to 5=strongly agree.

From the table majority of the respondents agreed that regular monitoring system should be in place to ensure that employees adhere to the solid waste management practices of the Restaurant (M=4.03, ±SD=.507), education/training programmes on solid waste management should be provided for employees so that they can appreciate the need for sustainable development practices (M=4.00, ±SD=.504) and restaurants should provide incentives to staff in order to encourage reducing, reusing and recycling solid waste (M=4.53, ±SD=.500).

Moreover, most of the respondents agreed that there is the need for a reliable data on solid waste generation for restaurants (M=4.27, ±SD=.616) and solid waste generation could be reused and recycled as much as possible through composting process and use this fertilizer for home gardening (M=4.34, ±SD=.624). However, the majority also disagreed that restaurants have solid waste management suggestion box (M=1.75, ±SD=1.290).

As indicated by Asase (2013) who noted that there is no single approach to the sustainable management of solid waste in the industry, it can be concluded that both staff and managers in foodservice industry of restaurants agreed to a number of the waste management strategic action plan for sustainable development of restaurants. With this, they indicated that restaurants should provide the funding needed for appropriate solid waste management practices; regular monitoring system should be in place to ensure that employees adhere to the solid waste management practices, and education/training programmes on solid waste management should be provided for employees so that they can appreciate the need for sustainable development practices.

Again, the restaurants should provide incentives to staff in order to encourage reducing and recycling solid waste; there is the need for a reliable data on solid waste generation for each Restaurant; and through the provision of additional bins, solid waste generation could be reduced and recycled as much as possible through composting process and use this fertilizer for home gardening. However, the restaurants did not have a solid waste management suggestion box. The results of this study have shown that there is the need to characterize waste management with the strictest approach to reduction, reuse, recovery, recycling, treatment and disposal (Seadon, 2006); implement a long-term and efficient solid waste management system in a societal

context which requires an integrated approach to addressing all aspects of a six-tier waste management program.

4.4 Effectiveness of Environmental Management Policies and Practices Relative to Solid Waste Management in Restaurants

This segment was meant to assess the efficacy of solid waste management strategies and procedures in restaurants in Sunyani Municipality. Managers' answers as seen in Table 4.11.

Table 4.11: Descriptive statistics on the effectiveness of environmental management policies and practices of solid waste management

Statements	N	Min	Max	Mean	±SD
The Assembly/licensed contractor determine the manner of disposal of all hazardous or health care wastes.	86	4	5	4.50	.503
The collection of solid wastes is subject to charging of fees approved by the Assembly in its fee fixing resolution.		3	5	4.28	.524
The Assembly conducts regular monitoring to find out solid waste management practices of the Restaurants/management.		1	5	3.34	1.508
The Assembly ensures that no person or firm deposit any solid waste at any site apart from the site designated by the Assembly for solid waste to be placed.		1	4	3.39	1.360
The Assembly ensures that we provide in our premises approved containers (plastic/galvanized containers) for storage of solid waste.		1	5	4.13	.610
The Assembly sanctions any person or firm that burns solid waste on their premises.		3	5	4.26	.513
The Assembly provides education to persons/employees of the firm on appropriate ways of storing solid waste for collection.		1	4	2.00	1.414
The Assembly sanctions individuals or businesses dumping solid waste in an open area, drain, gutter, landfill, open ground, quarry, river channel, marsh or position not designated for that reason by the Assembly.		3	5	4.35	.548
Assembly guarantees proper implementation of sewage by-laws and effective solid waste management activities.		1	5	3.28	1.411

Table 4.11 gives a representation of managers' assertions on the effectiveness of environmental management policies and practices of solid waste management in restaurants.

As seen above, most respondents decided that the Assembly/licensed contractor must decide how to dispose of any dangerous or health-care waste (M=4.50, ±SD=.503), the collection of solid wastes is subject to charging of fees approved by the Assembly in its fee fixing resolution (M=4.28, ±SD=.524) and the Assembly conducts regular monitoring to find out solid waste management practices of the Restaurants/management (M=3.34, ±SD=1.508).

Moreover, majority of the respondents also agreed that the Assembly ensures that no person or firm deposit any solid waste at any site apart from the site designated by the Assembly for solid waste to be placed (M=3.39, ±SD=1.360), the Assembly ensures that we provide in our premises approved containers (plastic/galvanized containers) for storage of solid waste (M=4.13, ±SD=.610) and the Assembly sanctions any person or firm that burns solid waste on their premises (M=4.26, ±SD=.513).

That notwithstanding, the majority agreed that the Assembly sanctions any person or firm that burns solid waste on their premises (M=4.26, ±SD=.513), the Assembly sanctions persons or firms who dump Solid waste in an open field, drain, gutter, landfill, open ground, quarry, river canal, marsh or location not allocated for this reason by the Assembly (M=4.35, ±SD=.548) and the Assembly guarantees that the bye-laws on this purpose are fully applied (M=4.35, ±SD=.548) sanitation and appropriate solid waste management practices (M=3.28, ±SD=1.411). On the contrary, the majority of the respondents disagreed that the Assembly provides education to persons/employees of the firm on appropriate ways of storing solid waste for collection (M=2.00, ±SD=1.414).

The results give a fair idea of the role of the Assembly in the management of waste. Such roles included providing approved containers for storage of solid waste, determining the manner of disposal of all hazardous/health care wastes, sanctioning of firms for mismanagement of solid waste, providing routine educational programs on waste management and the enforcement of bye-laws on sanitation and appropriate solid waste management practices.

From the above, it can be inferred that restaurant food service administrators decided on the efficacy of solid waste management strategies and procedures. This is because restaurants have contracted a licensed collector's services e.g., Zoomlion Company Ltd.) authorized by the Assembly to extract solid waste from their premises; and the Assembly/Licensed Contractor decides how all toxic or health-care waste is disposed of. Solid waste disposal is therefore subject to payments as authorized by the Assembly in its fee-fixing resolution; and the Assembly requires that restaurants have approved containers (plastic/galvanized containers) for solid waste storage at their premises.

Again, the Assembly punishes any individual or firm burning solid waste on their premises; and the Assembly punishes persons or firms dumping solid waste in open field, drain, gutter, landfill, open ground, quarry, river channel, swamp or areas not designated by the Assembly for that reason. However, the Assembly did not provide education to persons/employees of the firm on appropriate ways of storing solid waste for collection.

Also, the respondents were uncertain as to whether the Assembly conducts regular monitoring to find out solid waste management practices of the Restaurant; and were uncertain whether the Assembly ensures that no person or firm deposits any solid waste at any site apart from the site designated by the Assembly for solid waste to be

placed. Again, the managers were uncertain as to whether Assembly ensures proper enforcement of the bye-laws on sanitation and appropriate solid waste management practices.

4.5 Observation Results

4.5.1 Categories of solid wastes generated by restaurants

The researcher sought to corroborates the responses given by the respondents. The focus of the observation was to observe in real-time the very category of solid wastes generated by restaurants in the study area.

It was observed that wastes generated by Restaurants and restaurant operators could generally be categorized into Food/kitchen, paper, plastic/rubber, glass, cloths, ceramics and metal wastes. The table below showed the actual categorizations of waste that is generated in the industry.

Table 4.12: Categories of wastes generated by restaurants

Waste	Material
Papers	Printed menus, receipts and invoices, leaflets, product manuals, brochures, newspapers, carton cardboards, paper wrappers, packaging materials etc.
Food/kitchen	Discarded food ingredients, leftovers and unconsumed meals, fruit and vegetable peelings, leaves
Plastics	Polythene bags, rubber wrappers, shopping bags, bottles, plates
Ceramic	Plates and cups
Glass	broken glasses, plates
Cloths	Rags, napkins, table cloths,
Metals	Tin cans, food containers, aluminium foils used for packaging, tomato puree tubes etc.

From the results, it could be observed that most of the surveyed restaurants generated myriads of wastes ranging from food/kitchen wastes to metallic wastes in the course of their operations. Find below-captured pictures of the various wastes observed generated by the restaurants in the study area.

Plate 1: Food/Kitchen waste

Plate 2: Plastic and Rubber Waste

4.5.2 Separation of waste

The researcher further observed that the attitude of Restaurants and the restaurant operators towards the separation of waste in their solid waste management approach is rather poor. This is because it was observed that though in most restaurants visited bins were provided for the collection of waste; however, there was no indication

to separate the waste on any category whatsoever. The waste bins are available, but any form of waste generated is dumped into a bin without recourse to any form of waste separation.

Plate 3: Plastic and Rubber Waste

Other observations were that despite the provision and availability of waste bins for waste collection, there was sufficient evidence to suggest users still dumped waste on the ground to be swept back into bins later.

Plate 4: Waste bins with refuse on the ground

4.5.3 Level of readiness of restaurants to reduce, reuse and recycle solid waste

In terms of the readiness of the restaurants to reduce, reuse and recycle solid waste; it was observed that from all indications the restaurants were in no way ready to reduce, reuse and recycle solid waste. The impression was that the volume of waste generated was determined by the level of business operations for a given day. A high volume of waste generated implied a high level of activity. It thus becomes difficult to make efforts at reducing the waste that is generated through their operations. That notwithstanding, it was also apparent that there was little effort to reuse the waste. The observation was that everything was carried to the dumpsite. Considering the outcome that they find recycling of solid waste a high-cost endeavour, there is little to show for in terms of any commitment in that regard as to have the waste recycled. Needless to say, effective waste recycling system requires a huge investment of financial resources

most at the disposal of the central government and the private sector. There is no available waste recycling plant in the municipality; hence all waste goes into the dumpsite.

It is implored, however, that attention is given to the whole concept of solid waste management in the municipality. The municipality continues to expand hence the need for Restaurants and restaurant services. This also requires that cookery joints, restaurants, bars and restaurant services will increase, resulting in increased waste generation. This finding departs from the works of Momoh and Oladebeye (2010) who maintained that recycling had been used as a true method for reducing the quantity or volume of household solid waste entering the dumpsite.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study has confirmed that waste was generated in the foodservice industry of restaurants in the course of their activities. Solid and liquid wastes are generated very often in the course of their activities, but gaseous wastes are sometimes or rarely generated. Most restaurants do not have separate bins to sort out the types of solid waste The study has demonstrated that Ghana's foodservice industry generates a total of 9,985 kilograms of solid waste on a weekly basis. This comprised of metals2200 kg glass with 2140 kg, plastic 2089kg, food items 2029kg and paper 1527 kg of solid waste is generated in the Ghanaian food service industries.

The study has found that restaurants in the foodservice industry are ready to implement solid waste reduction programme because it can create significant cost savings in waste hauling fees, Restaurant serves a proper portion of food to reduce waste and also reduces solid waste by avoiding over preparation. The study also showed that restaurants adopt a paperless policy, including the use of electronic software or systems (e.g., E-copy) in order to reduce waste.

The study has also discovered that most of the restaurants donated equipment, furniture and other items for reuse to charity and also purchased reusable utensils and products rather than disposables as a means of managing solid waste.

To reduce solid waste going to landfill in order to reduce pollution, the employees were uncertain about it. Again, in recycling solid waste, the restaurants did not provide additional bins in order to segregate the recyclable materials; the restaurants had little interest in recycling solid waste because such activities are too expensive, and they were not prepared to recycle solid waste because such activities can be time-

consuming. The study observed that most of the restaurants provided waste bins but not for the purposes of separating the waste but as extra space to hold more waste.

Also, a number of the waste management strategic action plan for sustainable development of restaurants were identified. The strategies were that management in the foodservice industry of restaurants should provide the funding needed for appropriate solid waste management practices; regular monitoring system should be in place to ensure that employees adhere to the solid waste management practices, and education/training programmes on solid waste management should be provided for employees so that they can appreciate the need for sustainable development practices.

Again, the Municipal Assembly punishes any individual or firm burning solid waste on their premises and dumping solid waste in areas not designated by the Assembly for that reason. However, the Assembly did not offer training to the restaurant employees about acceptable forms to collect solid waste.

Also, the respondents were uncertain as to whether the Assembly conducts regular monitoring to find out solid waste management practices of the Restaurant; The management was uncertain as to whether Assembly ensures proper enforcement of the bye-laws on sanitation and appropriate solid waste management practices.

5.2 Recommendations

Based on research results and assumptions, the following suggestions were made.

1. The Environmental Protection Agency (EPA), the National Tourism Board and the Assembly should ensure that the foodservice industry of restaurants provide separate bins to sort out the types of solid waste (e.g. glass, paper, plastic, and rubber). This would help manage solid waste generation as solid waste can be reduced and recycled as much as possible.

2. It is commendable that both staff and management in the foodservice industry were ready to reduce solid waste. However, because they were not ready to reuse and recycle solid waste, it is recommended that the Environmental Protection Agency (EPA) and the Assembly organize education/training programmes on solid waste management for managers and employees of restaurants on the need to reduce, reuse and recycle solid waste so that they can appreciate the need for sustainable development practices. This would help Restaurants managers and employees to realize that reducing and recycling solid waste can create significant cost-saving effects. Also, in reducing solid waste, managers of restaurants should adopt a paperless policy, including the use of electronic software or systems (e.g., E-copy) in order to reduce waste. Again, managers should also provide incentives to employees who adhere to reducing, reusing and recycling solid waste so that they can be motivated.
3. On the waste management strategic action plan, it is recommended that restaurants should provide the funding needed for appropriate solid waste management practices and the Environmental Protection Agency (EPA), the National Tourism Board and the Assembly should conduct regular monitoring system in order to ensure that employees adhere to the solid waste management practices. Again, the restaurants and waste management companies should make available a reliable data on solid waste generation for each Restaurant and should provide a suggestion box on solid waste management so that employees and guests can make constructive suggestions on solid waste management for sustainable development.

4. It is recommended that Environmental Protection Agency (EPA) and Assembly should ensure proper implementation of sanitation by-laws on effective solid waste management activities. Managers and employees of the foodservice industry in restaurants should be encouraged by the Environmental Protection Agency (EPA), the National Tourism Board and the Assembly to consider recycling as important activities.

5.3 Suggestions for Further Research

This study examined solid waste management practices in restaurant food service industry in Ghana's Sunyani municipality. Restaurants in other regions of the country could replicate the study to find out what persists there. Also, the study involved managers and employees in the foodservice industry of restaurants as respondents for the study. Future studies may involve the workers from the Municipal Assembly, and the Environmental Protection Agencies (EPA) in order to find out the views they hold about solid waste management practices in their regions. Again, the study adopted the use of questionnaires as instruments for data collection. Future studies may consider using interview guides and observations in order to have first-hand information and be able to probe further and collect detailed information on the subject from respondents.

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APPENDIX A

QUESTIONNAIRE FOR STAFF

Questionnaire on "solid waste management practices in some selected restaurants in the Sunyani Municipality". The data collected through this instrument will only be used for academic purposes. I therefore ask for your full support and I promise you that the information given will be handled with the highest confidentiality.

SECTION A: DEMOGRAPHIC INFORMATION

Please address each of the following things by ticking the required response button.

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

2. Age:
   a. 16-19 years [ ]
   b. 20-29 years [ ]
   c. 30-39 years [ ]
   d. 40-49 years [ ]
   e. 40-49 years [ ]
   f. 50-59 years [ ]
   g. 60-69 years [ ]
   h. 70+ [ ]

3. Years of working experience:
   a. 1-5 years [ ]
   b. 6-10 years [ ]
   c. 11-15 years [ ]
   d. 16-20 years [ ]
   e. Above 20 years [ ]
   f.
4. Educational level:
   a. No formal education [ ]
   b. JHS [ ]
   c. SHS [ ]
   d. Tertiary [ ]

SECTION B: CLASSIFICATION OF SOLID WASTE

Please tick (√) the appropriate box to indicate your opinion on these statements.

5. Do you generate any unwanted substance or unusable material that is usually discarded?
   a. Yes [ ] b. No [ ]

If yes, please indicate the examples of waste (solid, liquid, gaseous wastes, etc.) that are usually generated.

Key:

Never: means the Restaurants does not generate such waste at all

Rarely: means the Restaurants scarcely generate such waste only once in a while (e.g. once in a week)

Sometimes: means the Restaurants generates such waste from time to time (e.g. twice in a week)

Often: means the Restaurants generates such waste regularly (e.g. thrice in a week)

Very Often: means the Restaurants generates such waste always (e.g. every day)

Example(s) of Waste Generated	Never	Rarely	Sometimes	Often	Very Often
6. Solid					
7. Liquid					
8. Gas.					

9. Does your outfit generate solid waste in the course of their duties?

   a. Yes [ ] b. No [ ]

10. How often do you generate solid waste in the course of your duties?

    a. Very Often [ ] b. Often [ ] c. Sometimes [ ] d. Rarely [ ]

    e. Never [ ]

11. What quantity of solid waste do you collect in a day?.....kg/tons

12. Do you provide separate bins to sort out the types of solid waste?

    a. Yes [ ] b. No [ ]

    If yes, how are the different categories of wastes sorted? Please tick as many as applicable:

    a. Glass [ ] b. Paper [ ] c. Plastic [ ] d. Rubber [ ]

Please tick (√) the appropriate box to indicate your opinion on the various form(s) of solid waste generated in your outfit.

STATEMENT: What form(s) of solid waste do you generate in your activities in this restaurant/Restaurants?	**Yes**	**No**
Rubbish (e.g. combustible rubbish i.e. paper, cardboard, plastics, textiles, rubber, leather, wood, furniture, and garden trimmings. Non-combustible rubbish i.e. ashes, glass, tin cans, aluminium cans, ferrous and other non-ferrous metals, and dirt).		
Food waste (i.e. uneaten portions of meals and trimmings from food preparation activities in kitchens, restaurants and cafeterias).		
Trash (rubble concrete and waste parts, installations and repairs, sinks, toilets, bathtubs, plumbing parts, automobile or truck parts, vehicle batteries, machinery, tree logs and limbs exceeding 6 inches in diameter and tree stumps).		
Special waste (street waste, animals and abandoned vehicles, litter from roadside, litter from municipal containers and bin debris).		
Hazardous waste (i.e. toxic, flammable, corrosive, radioactive, explosive and other dangerous materials).		

SECTION C: READINESS OF RESTAURANTS TO REDUCE, REUSE AND RECYCLE SOLID WASTE

Please tick (√) the appropriate box to indicate your opinion on how ready this Restaurant is in terms of reducing, reusing, and recycling solid waste. Key:

Strongly Disagree (SD) = 1; Disagree (D) = 2; Uncertain (U) = 3; Agree (A) = 4; and Strongly Agree (SA) = 5.

REDUCING	**SD**	**D**	**U**	**A**	**SA**
13. This Restaurant is commitment to reducing solid waste in order to promote a sustainable environment.					
14. This Restaurants is ready to implement solid waste reduction program because it can create significant cost savings in waste hauling fees.					
15. This Restaurant serves proper portion of food to reduce waste.					
16. This Restaurant adopts a paperless policy including the use of electronic softwares or systems (e.g. E-copy) in order to reduce waste.					
17. This Restaurant reduces solid waste by avoiding over preparation.					
REUSING					
This Restaurant composts spoiled food and leftover plate scrapings into organic materials than trucking them to landfills.					
This Restaurant donates equipment, furniture and other items for reuse to charity.					
This Restaurant purchases reusable utensils and products (such as: refillable pens and pencils, rechargeable batteries, durable cups, cutlery, provides cloth towels as an alternative to paper towels, etc.) rather than disposables.					

This Restaurants is motivated to reuse items in order to reduce solid waste going to landfill and reducing pollution.					
RECYCLING					
This Restaurant repairs solid waste items rather than buy new.					
Additional bins have been provided in order to segregate the recyclable materials.					
The management of this Restaurant considers recycling (cardboards, papers, cans, plastics, bottles, etc) as important activities.					
This Restaurant has little interest in recycling solid waste because such activities are too expensive.					
This Restaurant tries as much as possible not to contaminate waste food because it is an important role in the waste recycling programme					
Recycling solid waste can be time-consuming hence the unpreparedness of this Restaurant to adopt such activities.					

SECTION D: WASTE MANAGEMENT STRATEGIC ACTION PLAN FOR SUSTAINABLE DEVELOPMENT OF RESTAURANTS

Please tick (√) the appropriate box to indicate your opinion on these statements.

Key: Strongly Disagree (SD) = 1; Disagree (D) = 2; Uncertain (U) = 3; Agree (A) = 4; and Strongly Agree (SA) = 5.

What strategies can be adopted by restaurants in solid waste management	SD	D	U	A	SA
This Restaurant should provide funding needed for appropriate solid waste management practices.					
Regular monitoring system should be in place to ensure that employees adhere to the solid waste management practices of the Restaurant.					
Education/Training programmes on solid waste management should be provided for employees so that they can appreciate the need for sustainable development practices.					
This Restaurant should provide incentives to staff in order to encourage reducing, reusing and recycling solid waste.					
This Restaurant has a solid waste management suggestion box.					
There is the need for a reliable data on solid waste generation for this Restaurant.					
Through the provision of additional bins, solid waste generation could be reused and recycled as much as possible through composting process and use this fertilizer for home gardening.					

Others, please specify.....

.....

APPENDIX B

QUESTIONNAIRE FOR MANAGERS

Questionnaire on "solid waste management practices in some selected restaurants in the Sunyani Municipality". This questionnaire is purely for academic work. I therefore ask for your maximum co-operation and assure you that information provided will be treated with utmost confidentiality.

SECTION A: DEMOGRAPHIC INFORMATION

Please respond to each of the following items by ticking (√) the appropriate response box.

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

2. Age:
   a. 16-19 years [ ]
   b. 20-29 years [ ]
   c. 30-39 years [ ]
   d. 40-49 years [ ]
   e. 50-59 years [ ]
   f. 60-69 years [ ]
   g. 70+ [ ]

3. Years of working experience:

   a. 1-5 years [ ]

   b. 6-10 years [ ]

   c. 11-15 years [ ]

   d. 16-20 years [ ]

   e. Above 20 years [ ]

4. Educational level:

   a. No formal education [ ]

   b. JHS [ ]

   c. SHS [ ]

   d. Tertiary [ ]

SECTION B: CLASSIFICATION OF SOLID WASTE

Please tick (√) the appropriate box to indicate your opinion on these statements.

5. Do you generate any unwanted substance or unusable material that is usually discarded?

   b. Yes [ ] b. No [ ]

If yes, please indicate the examples of waste (solid, liquid, gaseous wastes, etc.) that are usually generated.

Key:

Never: means the Restaurants does not generate such waste at all

Rarely: means the Restaurants scarcely generate such waste only once in a while (e.g., once in a week)

Sometimes: means the Restaurants generates such waste from time to time (e.g., twice in a week)

Often: means the Restaurants generates such waste regularly (e.g., thrice in a week)

Very Often: means the Restaurants generates such waste always (e.g., every day)

Example(s) of Waste Generated	**Never**	**Rarely**	**Sometimes**	**Often**	**Very Often**
Solid					
Liquid					
Gas					

6. Does your outfit generate solid waste in the course of their duties?

   a. Yes [ ] b. No [ ]

7. How often do you generate solid waste in the course of your duties?

   a. Very Often [ ] b. Often[ ] c. Sometimes [ ] d. Rarely [ ]

   e. Never [ ]

8. What quantity of solid waste do you collect in a day?.....kg/tons

9. Do you provide separate bins to sort out the types of solid waste?

   a. Yes [ ] b. No [ ]

10. If yes, how are the different categories of wastes sorted? Please tick as many as applicable:

    a. Glass [ ] b. Paper [ ] c. Plastic [ ] d. Rubber [ ]

Please tick (√) the appropriate box to indicate your opinion on the various form(s) of solid waste generated in your outfit.

STATEMENT: What form(s) of solid waste do you generate in your activities in this restaurant/Restaurants?	**Yes**	**No**
Rubbish (e.g. combustible rubbish i.e. paper, cardboard, plastics, textiles, rubber, leather, wood, furniture, and garden trimmings. Non-combustible rubbish i.e. Ashes, glass, tin cans, aluminium cans, ferrous and other non-ferrous metals, and dirt).		
Food waste (i.e. uneaten portions of meals and trimmings from food preparation activities in kitchens, restaurants and cafeterias).		
Trash (rubble concrete and waste parts, installations and repairs, sinks, toilets, bathtubs, plumbing parts, automobile or truck parts, vehicle batteries, machinery, tree logs and limbs exceeding 6 inches in diameter and tree stumps).		
Special waste (street waste, animals and abandoned vehicles, litter from roadside, litter from municipal containers and bin debris).		
Hazardous waste (i.e. toxic, flammable, corrosive, radioactive, explosive and other dangerous materials).		

SECTION C: READINESS OF RESTAURANTS TO REDUCE, REUSE AND RECYCLE SOLID WASTE

Please tick (√) the appropriate box to indicate your opinion on how ready this Restaurant is in terms of reducing, reusing, and recycling solid waste.

Key: Strongly Disagree (SD) = 1; Disagree (D) = 2; Uncertain (U) = 3; Agree (A) = 4; and Strongly Agree (SA) = 5.

REDUCING	**SD**	**D**	**U**	**A**	**SA**
This Restaurant is commitment to reducing solid waste in order to promote a sustainable environment.					
This Restaurants is ready to implement solid waste reduction program because it can create significant cost savings in waste hauling fees.					
This Restaurant serves proper portion of food to reduce waste.					
This Restaurant adopts a paperless policy including the use of electronic softwares or systems (e.g. E-copy) in order to reduce waste.					
This Restaurant reduces solid waste by avoiding over preparation.					
REUSING					
This Restaurant composts spoiled food and leftover plate scrapings into organic materials than trucking them to landfills.					
This Restaurant donates equipment, furniture and other items for reuse to charity.					
This Restaurant purchases reusable utensils and products (such as: refillable pens and pencils, rechargeable batteries, durable cups, cutlery, provides cloth towels as an alternative to paper towels, etc.) rather than disposables.					

This Restaurants is motivated to reuse items in order to reduce solid waste going to landfill and reducing pollution.					
RECYCLING					
This Restaurant repairs solid waste items rather than buy new.					
Additional bins have been provided in order to segregate the recyclable materials.					
The management of this Restaurant considers recycling (cardboards, papers, cans, plastics, bottles, etc) as important activities.					
This Restaurant has little interest in recycling solid waste because such activities are too expensive.					
This Restaurant tries as much as possible not to contaminate waste food because it is an important role in the waste recycling programme					
Recycling solid waste can be time-consuming hence the unpreparedness of this Restaurant to adopt such activities.					

SECTION D: WASTE MANAGEMENT STRATEGIC ACTION PLAN FOR SUSTAINABLE DEVELOPMENT OF RESTAURANTS

Please tick (√) the appropriate box to indicate your opinion on these statements. Key: Strongly Disagree (SD) = 1; Disagree (D) = 2; Uncertain (U) = 3; Agree (A) = 4; and Strongly Agree (SA) = 5.

What strategies can be adopted by restaurants in solid waste management?	**SD**	**D**	**U**	**A**	**SA**
This Restaurant should provide funding needed for appropriate solid waste management practices.					
Regular monitoring system should be in place to ensure that employees adhere to the solid waste management practices of the Restaurant.					
Education/Training programmes on solid waste management should be provided for employees so that they can appreciate the need for sustainable development practices.					
This Restaurant should provide incentives to staff in order to encourage reducing, reusing and recycling solid waste.					
This Restaurant has a solid waste management suggestion box.					
There is the need for a reliable data on solid waste generation for this Restaurant.					
Through the provision of additional bins, solid waste generation could be reused and recycled as much as possible through composting process and use this fertilizer for home gardening.					

Others, please specify.....

.....

.....

SECTION E: EFFECTIVENESS OF ENVIRONMENTAL MANAGEMENT POLICIES AND PRACTICES OF SOLID WASTE MANAGEMENT IN RESTAURANTS

Please tick (√) the appropriate box to indicate your opinion on these statements. Key: Strongly Disagree (SD) = 1; Disagree (D) = 2; Uncertain (U) = 3; Agree (A) = 4; and Strongly Agree (SA) = 5.

How effective are the environmental management policies and practices of solid waste management in your Restaurant	**SD**	**D**	**U**	**A**	**SA**
This restaurant/Restaurants has engaged the services of a licensed collector (e.g. Zoomlion Company Ltd.) approved by the Assembly to collect solid waste generated from our premises.					
The Assembly/licensed contractor determine the manner of disposal of all hazardous or health care wastes.					
The collection of solid waste is subject to charging of fees as approved by the Assembly in its fee fixing resolution.					
The Assembly conducts regular monitoring to find out solid waste management practices of the Restaurant.					
The Assembly ensures that no person or firm deposit any solid waste at any site apart from the site designated by the assembly for solid waste to be placed.					
The Assembly ensures that we provide in our premises approved containers (plastic/galvanized containers) for storage of solid waste.					
The Assembly sanctions any person or firm that burns solid waste on their premises.					
The Assembly ensures that we do not bum solid waste on our premises.					

The Assembly provides education to persons/employees of the firm on appropriate ways of storing solid waste for collection.					
The Assembly sanctions persons or firms who dump solid waste in an open space, drain, gutter, sewer, open land, quarry, river channel, swamp or their place not designated by the Assembly for that purpose.					
The Assembly ensures proper enforcement of the bye-laws on sanitation and appropriate solid waste management practices.					

Others, please specify.....

.....

.....

.....

Thank You.

APPENDIX C

OBSERVATION CHECKLIST

Name of Principal Investigator (PI): COMFORT GYEDUAA

SOLID WASTE MANAGEMENT PRACTICES IN SOME SELECTED RESTAURANTS IN THE SUNYANI MUNICIPALITY		PI TO COMPLETE		
		Yes	**No**	**N/A**
Classification of Solid Waste				
1.	Does this Restaurants generate solid waste?	☐	☐	☐
	If yes, indicate how often solid waste is generated in this Restaurants?			
	☐ Everyday ☐ Twice in a week ☐ Three times in a week ☐ Four times in a week			
2.	Are separate bins provided to sort out the types of solid wastes?	☐	☐	☐
	If yes, how are the different categories of solid wastes sorted?			
	☐ Glass ☐ Paper ☐ Plastic/Rubber ☐ Ceramics ☐ Food leftovers and vegetables			
3. What quantity of solid waste is collected in a day?				

Days	**Glass kg**	**Papers kg**	**Plastic kg**	**Rubber Kg**	**Food kg**	**Total Kg**
Monday						
Tuesday						
Wednesday						
Thursday						
Friday						
Saturday						
Sunday						
Total						

4. Categories of solid waste generated by Restaurants and restaurants.

5. Separation of Waste

6. Level of readiness of restaurants to reduce, reuse and recycle waste