A ZERO WASTE MANAGEMENT MODEL FOR SMALL HOTELS: A CASE STUDY IN THE KOH SAMUI, KOH PHA NGAN SURAT THANI

Choosak Choosri

A Dissertation Submitted in Partial
Fulfillment of the Requirements for the Degree of
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ABSTRACT

Title of Dissertation	A Zero Waste Management Model for Small Hotels: A Case study in the Koh Samui, Koh Pha Ngan Surat Thani
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This thesis aimed to examine the situation of waste management problems encountered by small hotels by focusing on investigating the causes of waste generation and on reducing, reusing, recycling and recovering the waste in order to minimize the waste to be finally disposed of by means of incineration/landfill, which is appropriate based on the prioritization of zero waste management. There were three research questions: (1) what are the factors in the zero waste management of small hotels? (2) What is the best practice in the zero waste management? and (3) What is the effectiveness of the zero waste management model of small hotels?

The researcher found that there are eight factors involved with the zero waste management of small hotels and each of them is related to each other, but their priorities are different: (1) employee cooperation in waste management, (2) waste management methods, (3) hotel owners/managers contributing to waste management, (4) hotel's regulations contributing to waste management, (5) waste management expenses, (6) hotel's locations, (7) customers, and (8) seasons contributing to waste management. In addition, the researcher found that employee cooperation in waste management is a factor that well supports the waste management if these employees are willingly to provide their cooperation, but it will be a factor that obstructs the waste management if they do not provide their cooperation.

There are four steps of zero waste management. Firstly, "Plan: P" of zero waste management (PZWM) is to set the waste management policy by hotel

owners/managers and includes both planning and implementing the policy. Secondly, “Do: D” is based on 4Rs starting with introducing environmentally friendly products in the hotels (reduction of waste). When such products have been completely utilized at their highest benefits in the hotels, they will become four types of waste: food waste, recyclable waste, non- recyclable waste, and toxic waste, and then they are classified by type to re-utilize them again by means of reusing, recovering and recycling based on its properties. Thirdly, “Check: C” is to define a checking method in writing and to report the result to the hotel management that will determine improvement measures. Finally, “Action: A” is to schedule an appropriate meeting time that can solve the problem of implementing the action plans and the meeting agenda are recorded and then implemented in the PDCA cycle. All issues concerned with the effectiveness of the zero waste management model were accepted by actual users and were appropriate in four views: finance, customers, process, and development and learning.

The contributions of this study can be separated into as part, The academic contribution and managerial contributions. The first contribution is concerned with the factors supporting the waste management, especially employee cooperation in which they are willing to do so and have a good habit of environmental conservation that can be applied in their daily life as an expectation of the community. Secondly, the process of zero waste management of small hotels can be used as an example of actions. Thirdly, this study serves as a guideline for to true research with regard to hotel management to in crease environmental friendship in other aspects, such as wastewater, energy, and noise pollution. In addition, there are managerial contribution. Firstly, a good waste management of hotels can help reduce expenses and decrease income. Secondly, the zero waste management of hotels can be applied with other types of service businesses, such as spa business. Finally, employee cooperation in waste management can be created as a habit in their daily life.

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I would like to thanks waste the management experts who devoted their time to attend group discussions in order to examine the effectiveness of the zero waste management of small hotels as well as owners/managers of 34 hotels located at Koh Samui and Koh Pha Ngan in Surat Thani.

I have leant that the phd study is a long journey and I that as face will many problems and barriers, but what I am most proud of is that I have learnt how to solve such problems and barriers that can be applied in my real life in the future. Most importantly, if this thesis will take part in changing the waste management of small hotels as expected, this success is inevitably a result of constant support, assistance and encouragement from Wandee Kongkaew, Manas Polpakdee, and Wanida Polpakdee, my mother, uncle and aunt, respectively.

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CHAPTER 1

INTRODUCTION

1.1 Inroduction

Hotel business must experience a waste management problem with an environmental impact due to the excessive use of energy and natural resources and to the facilities in the hotel business, which is more than the impact of a building of the same size (Rada, 1996; Robinot & Giannelloni, 2010). Italian National Agency for the Protection of the Environment and for Technical Services (APAT) (2002) note that the hotel business generates a negative impact on the environment because it uses more natural resources than necessary due to the nature of its operations and services relying on the much use of energy and natural resources. Similarly, Jaruwan Kasemtrap (2009) state that the world's tourism and accommodation industry takes part of producing greenhouse gas emissions from its room services and luxury activities in hotels. Kirk (1995) supports this claim that hotel operators have increasingly faced the pressure on corporate social responsibility and environmental management participation. In addition, Lamond (2008) suggested that the hotel business needs to reduce the use of natural resources and to be as much socially responsible for society as possible. At present, businessmen and general people have increasingly focused on preserving the environment and protecting the nature. Many studies have focused on the relationship between the business performance and the environment, such as Gilley, Worrell, Davidson, and El-Jelly (2000) and Link and Naveh (2006). Melnyk, Sroufe, and Calantone (2003) indicate that a good environmental management of the hotels makes the business hotel increasingly competitive.

Small hotels are one of the accommodations that customers are interested to stay because of their full facilities and speedy services, which can satisfy their

customers (Morrison & Conway, 2007), Morrison and Teixeira (2004) defines a small hotel that includes physical convenience of goods and services that is better accessible to the customers than a large hotel as well as the number of its employees and rooms or beds. Clarified the definition of a small hotel based on two aspects of quantity and quality. Quantitatively, a small hotel must have no more than 50 rooms and 10 employees as well as its market share and management is controlled by its owner. Qualitatively, services of a small hotel, especially service accessibility, are better than a large hotel.

Operations of a small hotel have more impact on the environment than a large hotel in particular its waste. Services of a small hotel consist of activities that generate waste, including used paper from office, food scraps from restaurant, containers such as glass bottles and plastic cans, aluminum in good condition, and cardboards from boxes (Dief & Font, 2010). In addition, Becklake (1991) states that a small hotel needs to increase its readiness to reduce environmental impact by managing the landfill of its waste. This landfill contributes to the breakdown of waste and therefore causes a groundwater poisoning and methane emissions that affect global warming. It also causes problems for surrounding communities in the form of odor and flies. Kharbanda and Stallworthy (1990) and International Hotel Environmental Initiative (IHEI) (2002) report that customers of small hotels generate waste affecting the environment up to 1 kilogram per day and that this waste has accumulated more and more. The article written by Padungsirikul (2003) supports that the management of recycled waste in Thailand in 2000 was at 16-34% of all wastes generated, but only 7% (2,360 tons/day) were actually reused, which is very low compared with the waste recycling rate of Denmark, more than 80%, Germany, Netherlands, Finland, Ireland and Italy, 30-50%, and Luxembourg, 10% (Brodersen, Clemons, Carter, Wimberly, & Ramakrishnan, 2002). According to previous studies on the management of eco-friendly small hotels, there are five areas of management. First is the wastewater management. For example, Feenberg and Mills (1980) states that a hotel should install a grease trap for receiving the wastewater generated from its operations before discharging into the wastewater treatment system. Also, treated wastewater can be reused in its activities, such as watering the plants in different areas of the hotel. The hotel should check and take care of its wastewater treatment system on a regular

basis. Second is the management of air pollution. Chan and Lam (2002) and Kozak and Nield (2004) reported that the hotels should avoid buying or using the products that cause Chloro-fluorocarbons (CFCs) and should buy the vehicles that will be used in their hotels with a good burning system to reduce air pollution. Third is the management of noise pollution. Trung and Kumar (2005) describes that the noise caused by some activities of a hotel, such as noise from the cooling water system or from the laundry room, can cause noise pollution to its employees or neighboring communities. Fourth is the energy management. Khemiri and Hassairi (2005) report that the hotel business should comply with the best practice in environmental management. Hotels should have a systematic and ongoing collection of energy use data so that they can better plan the improvement of energy use for their future. Also, Tzschentke, Kirk, and Lynch (2008) state that the hotel's environmental management should focus on the improvement and use of appropriate and energy-saving electrical equipment. Fifth is the waste management. It is observed that there are very few studies on the waste management in a small hotel as shown in Table 1.1. Especially in Thailand, there are studies on the waste management of a large hotel, but there are very few studies on this subject in a small hotel. For example, Radwan, Jones, and Minoli (2010) examine the problem of waste management of small hotels titled "Managing solid waste in small hotels" and state that most studies investigating the waste management focus on the recycling of household waste or on the development of a waste management program based on the power of local authorities while there are only few studies on waste management in small hotels. In addition, Wilson, Velis and Cheeseman (2006) note that in Thailand the reuse of waste is a small process based on separation by workers. There is no registration and therefore tax liability resulting in the only separation of commercially valuable materials without taking into account the pollution management. Thus, most wastes with no trading are left as a burden for the collection by organizations responsible for waste management. Moreover, in Thailand, (Table 1.1) examine the environmental and resource quality management of small hotels and show that most hotels have energy saving (69%), wastewater management (69%), water drainage management (52%), air and noise management (51%), and waste management (49%). This indicates that the waste management of small hotels also has the smallest proportion in all aspects of

evaluations. The research findings specify that a good waste management should include procedures, such as waste sorting and selection of reusable products to manage waste effectively. In addition, the Bangkok Metropolitan Administration. (2013) reports that the waste occurs around 15.11 million tons nationwide or approximately 41,410 tons per day, but the amount of waste that is disposed of properly according to the right principle is only 15,594 per day or 38% of the total amount of waste occurred. The Office of Natural Resources and Environmental Policy and Planning (2012) report the waste situation in tourist attractions in the country, especially in the islands of Koh Samui and Koh Pha Ngan located in the Gulf of Thailand in Surat Thani and well-known by both Thai and foreign tourists, in which there is a problem of as many as 15,000 tons of waste waiting for its disposal. In addition, report that in 2012 the amount of waste generated on Koh Samui and Koh Pha Ngan was at the average of 168 tons per day, but the disposal by means of landfill, which is incomplete and improper, affected soil and groundwater nearby.

Table 1.1 Previous Studies on Environmental Management in Small Hotels

Authors/Year	Waste	Air Pollution	Noise Pollution	Sewage	Energy
Piyada Wachirawong Sakorna and Usuanee Timsungnern (2015) (Thailand)	✓				
Cooper and Findlater (Eds.) (1990)				✓	
De Grosbois (2012)			✓		
Ng, Musser, Persily and Emmerich (2012)		✓			
Hsieh (2012)					✓
Feenberg and Mills (1980)				✓	
Yen, Chen, Sheu, Lin and Horng (2012)				✓	
Deya Tortella and Tirado (2011)				✓	
Mbaiwa (2011)			✓		

Table 1.1 (Continued)

Authors/Year	Waste	Air Pollution	Noise Pollution	Sewage	Energy
Radwan, Jones, and Minoli (2010) (Thailand)	✓				
Radwan, Jones and Minoli (2010)	✓				
Beccali, La Gennusa, Lo Coco and Rizzo (2009)					✓
Goswami (2009)			✓		
Tzschentke, Kirk and Lynch (2008)					✓
Dalton, Lockington and Baldock (2008)					✓
Graci and Dodds (2008)				✓	
Kasim (2007)				✓	
Han and Naeher (2006)		✓			
Hajkowicz (2006)				✓	
Tran (2006)				✓	
Trung and Kumar (2005)			✓		
Mulcahy, Evans, Hammond, Repace and Byrne (2005)		✓			
Khemiri and Hassairi (2005)					✓
Kozak and Nield (2004)		✓			
Canoves, Villarino, Priestley and Blanco (2004)			✓		
Jones (2002)			✓		
Chan and Lam (2002)		✓			
Ayres (2000)			✓		
Hildebrand (1970)			✓		
Total	**3**	**5**	**8**	**8**	**5**

According to such study, the volume of waste increased by the economic growth and tourism expansion, but there was a lack of good management, which caused an environmental impact. Therefore, this study aims to study the problem of waste management in small hotels on Koh Samui and Koh Pha Ngan in Surat Thani.

1.2 Justification of the Study

This research on the zero waste management of small hotels is important for many reasons. Firstly, the owners of hotel business should focus on reducing the use or utilization of natural resources as much as possible as well as must be responsible to society, environment and community and be environmentally friendly resulting in a good image for the hotels themselves, which will promote their advantages, and more importantly, will not pay unnecessary expenses, and can comply with the government's environmental management (Masau & Prideaux, 2003). Secondly, current approaches/methods of waste management of small hotels do not meet the ISO 14001 environmental standard, which rely on the landfill or incineration that affects the environment (Morrison, 1998). Thirdly, the development of waste management of small hotels still lacks an integration of processes. Previous study examined the factors and procedures according to the ISO 14001 environmental standard but separately. Fourthly, entrepreneurs of small hotels are worried about reducing the amount or recycling of waste as well as about expenses that are too expensive and time consuming (Pirani & Arafat, 2014). Chan and Lam (2001) report that a good long-term waste management in hotels will result in cost savings and revenue increase. Finally, customers of small hotels call for environmentally friendly hotels increasingly because currently tourists prefer to stay in these hotels as they feel participated in reducing pollution and energy saving as well as can help recommend a good hotel to next customers (Masau & Prideaux, 2003).

1.3 Research Questions

The main research question of this study is what a good form of waste management in small hotels is by focusing on the factors and processes in waste management. In order this study to achieve its goals, the following research questions are defined:

1) What are the factors of zero waste management of small hotels?

2) What is the best practice of zero waste management? This is divided into 4 sub-questions as follows:

(1) What is the planning for zero waste management?

(2) What is the operation of zero waste management?

(3) What is the performance examination of zero waste management?

(4) What is the hotel management's performance of zero waste management?

3) What is the effectiveness of zero waste management of small hotels?

1.4 Scope of the Study

The scope of this research examines the environmental management of the hotel business by focusing on the process of zero waste management of small hotels located in Koh Samui and Koh Pha Ngan districts of Surat Thani where many tourists prefer to visit. The duration of the research is from January 1, 2013 to December 31, 2015. The procedure is as follows: The first step is to prepare the related documents and research, contact the places and data providers, and develop a tool (January to December 2013); the second step is to conduct on-site data collection during the period of less customers so that the hotel entrepreneurs have more time to discuss (January to October 2014); the third step is to process and analyze the data (November 2014 to March 2015); and the final step is to make a report for publicizing the findings (April to December 2015).

1.5 Source of the Data

The study was adopted qualitative approach by using in-depth interview technique as a tool to collect the data. The participant are interviewing entrepreneurs /managers/employees who are involved in waste management of 34 small hotels situated on Koh Samui and Koh Pha Ngan 3 (Department of Provincial Administration, 2014). Secondary data were obtained from the study of zero waste management and factors affecting waste management. The researcher examined the factors of entrepreneurs, approaches, employees, geography, finance, hotel's regulations, customers, seasons that affect the waste management. The policies must be established by hotel owners and must comply with the services of small hotels and with real waste problems of the hotels. In addition, the researcher examined five areas of waste management behaviors: reduce, categorize, recovery, reuse, and recycle, which is the overall behavior of the zero waste management. Finally, the researcher examined the performance examination of owners/managers/stakeholders to ensure that their operations are ongoing, adequate and effective.

1.6 The Contribution of the Study

The contribution of the study is divided into two parts. The first part is for academic contributions and the second part is for managerial contributions. For academic contributions, firstly, the findings of this study have taken part in studying the theory/knowledge of zero waste management for small hotels by 4Rs principle (Reduce, Reuse, Recycle, Recovery) as well as the factors of encouraging hotel's waste management, management, employees, geography, finance, hotel's regulations and customers. Secondly, the researcher developed the concept of the zero waste management for small hotels based on a five-step process: the first step is to analyze various factors that promote the zero waste management; the second step is to commonly establish the plans and policies by hotel owners/managers regarding the zero waste management center; the third step is to practice the hierarchy of waste management based on 4Rs principle, which makes less waste; the fourth step is to check and correct the errors; and the final step is to commonly conduct the zero waste

management by owners/managers of small hotels in order to encourage a better continuity. For managerial contributions, the best practice in reducing waste benefits the hotel's stakeholders. Firstly, it effectively creates new knowledge for entrepreneurs/employees/those involved in the zero waste management to implement it as a good waste action plan. Secondly, this knowledge can be taken as a guide to create a strategy for waste management to enhance the good image of the hotels so that more travelers decide to stay. Thirdly, the hotels have a good waste management accepted by both community and hotels in terms of the creation of an environmental friendliness. Finally, all employees involved can utilize the knowledge about waste management in creating an environmental friendliness for community and everyday life.

1.7 Definition Key Terms

Conditions for terms used in this study are based on the methods of acquisition by means of the review of the literature/theories on the meaning of such words and are used throughout this paper.

Zero waste management (ZWM) refers to the management of products with a wide variety of ways to reduce the amount of waste as much as possible and to manage the waste based on the process of Reduce, Categorize, Reuse, Recovery and Recycle to take most advantage of waste before destroying it according to its properties (Dileep, 2007, p. 379).

Small hotel refers to a hotel that is directly invested and managed by one man /one small group/owner of a personal nature with unique facilities/products/services and a small number of employees and 10-50 rooms (Morrison, 1998, p. 133).

Plan-Do-Check-Action (PDCA) Wheel refers to the Deming wheel theory with a working process to complete the work correctly, efficiently and reliably, which includes Plan, Do, Check and Action (Menand, 2001, p. 145).

Environmental Management Standard System (ISO 14001) refers to the ISO 14001 International Standard on international environmental management set by the International Organization for Standardization, which is located in Geneva, Switzerland, and serves as an international standard for determining the

environmental quality in terms of production as well as covers employee training and management of responsibility for organization's systems that require environmental actions (Chan & Wong, 2006, p. 402).

Reduce refers to the consideration of buying a product that is environmentally friendly, a product with less or no packaging, and a product in large quantities to reduce packaging, as well as the storage and control of proper usage to reduce the amount of waste (Deming, 1982).

Reuse refers to one of the practices for the valuable use of available waste by reusing used and usable items to reduce the use of new resources, including reducing the amount of waste (Deming, 1982).

Recycle refers to the processing of various materials, such as paper, glass, plastic, steel and aluminum, by various processes to reuse them (Deming, 1982).

Recovery refers to the reuse of organic substances by composting, bio-conversion process and soil treatment that are beneficial to improve the agricultural areas or trees within the hotel or beneficial to the ecosystem (Deming, 1982).

1.8 Structure of the Study

This study on the zero waste management of small hotels: a case study of Koh Samui and Koh Pha Ngan in Surat Thani consists of five chapters. Chapter One provides an introduction of the background and significance of the problem, targets of the study, research questions to find answers of the qualitative research, recommendations for the scope of the study in terms of population, content, area and time, expected benefits of the research, both for academic and managerial contributions, to supplement the understanding of the readers, definitions of key words found in this study, structure of five chapters in this study, and summary of Chapter One.

Chapter Two starts with a literature review on the part of the meaning and significance of a small hotel followed by the research question number one, i.e. review of relevant literature, such as extracting factors for previous zero waste management of small hotels into seven factors, and by the research question number two regarding the best practice in zero waste management, which consists of four

research sub-questions: what is the planning for zero waste management?, what is the operation of zero waste management?, what is the performance examination of zero waste management? and what is the hotel management's performance of zero waste management? In addition, three relevant concepts and theories were reviewed, including ISO 14001 Environmental Management Standard, management-related concept and theory, i.e. Plan, Do, Check, Action (PDCA) Wheel of Edward Deming and concept and theory on the performance evaluation using the Balanced Scorecard. According to the literature review, the researcher developed a framework for research that is related to all factors that must be considered in the zero waste management and the administration of small hotels by using the PDCA model as the guideline. The final part of Chapter Two is its summary.

Chapter Three explains the methodology of the study. The first part describes the overall research plan, which is a story of what to do in the research, and assigns research activities to unravel from the beginning to the end to achieve the objectives of the research established. This chapter also explains why it is required to use a qualitative research technique in this research as well as describes the conditions of research areas for data collection followed by the design of data providers and collection from phenomena happened in the research areas by means of interviews and small-group discussions with research questions 1, 2 and 3, respectively. This chapter tells the steps taken in the data analysis followed by the way of a thorough check of ethical research and the summary of Chapter Three.

Chapter Four reports the research findings by starting with the test result of tool before actual study focused on building the tool to match the research questions with an examination of accuracy and reliability before the interviews with entrepreneurs/managers of the hotels located on Koh Samui and Koh Pha Ngan. Although these interviews were adjusted as appropriate to the situation, they still matched the research questions. This study has three objectives: to examine the factors in waste management of small hotels, to examine the current process of zero waste management of small hotels, and to determine the effectiveness of zero waste management of small hotels. The interview form was developed from the theory of policy and planning of zero waste management, operations of zero waste management, performance checking, and act or management review for performance

of hotel's management or owners/managers as a guide form for finding the answers. In this research, the researcher focused on waste management at its source only occurred within small hotels and did not examine the waste management at its middle and destination. The researcher wanted to know the consequences, waste management behaviors of the hotels, prevention of used products from becoming waste, and categorization and reuse of waste to benefit the most. The final part of this chapter is its summary.

Chapter Five discusses the overall results and conclusions of the study, including the discussions of findings of three research questions, as well as summarizes the theoretical and business significances and definitions based on the research findings. In addition, this chapter provides the benefits from this study as a new knowledge followed by the limitations of the study and recommendations for future research. The final part of this chapter provides the conclusion of this thesis. The overall structure of this research is shown in Figure 1.2 below

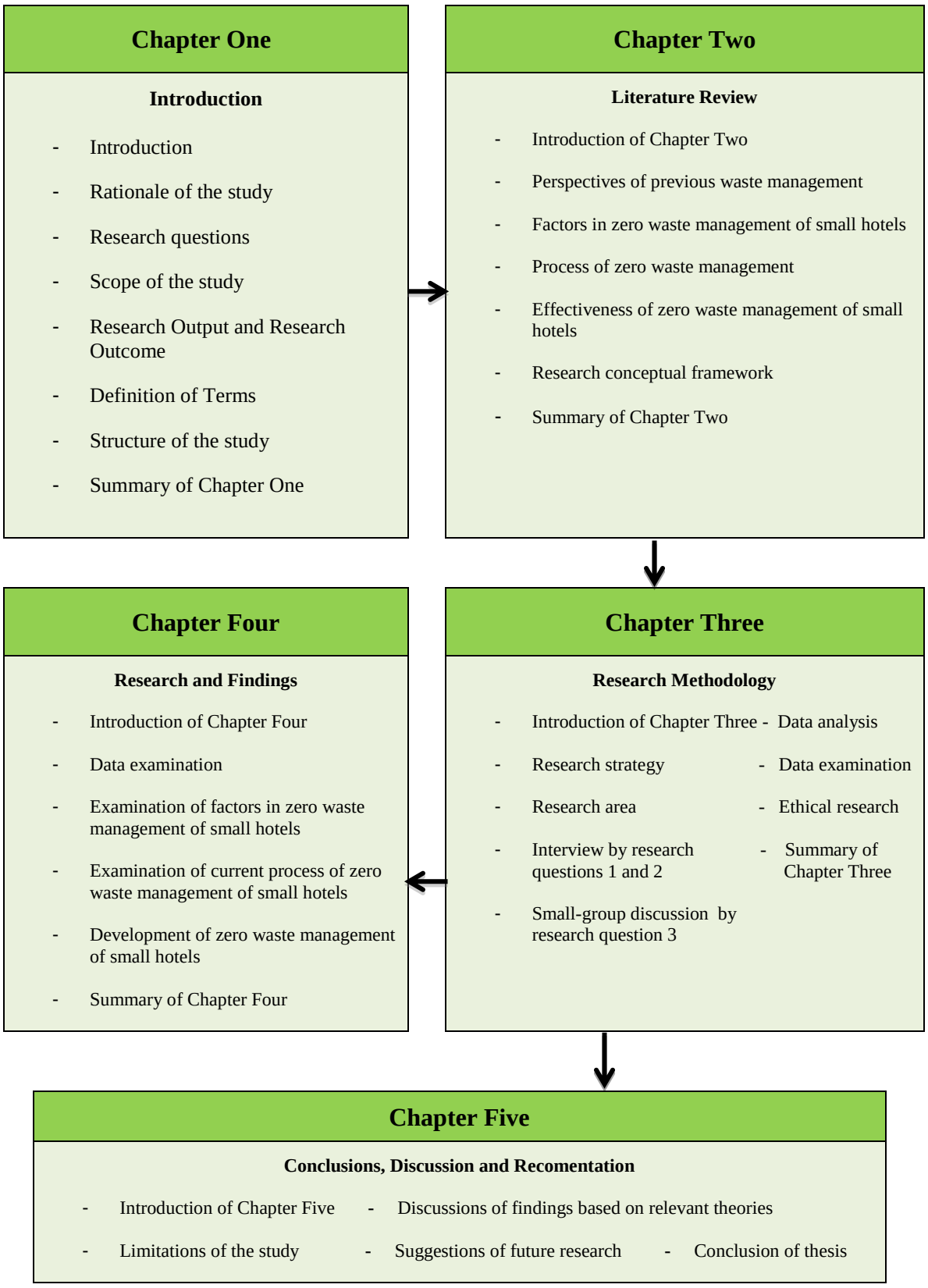

Figure 1.1 Structure of the Study

1.9 Summary

This chapter begins by presenting an overview of the research and two reasons to do this research. Firstly, the study found that the potential of environmental friendliness of small hotels is present but less. Secondly, a good waste management must start from the management of its source by generating as less waste as possible. The first research question aims to know the real problems arising in the present time or factors that occur in waste management that reflect the perspectives of hotel entrepreneurs in order to determine the real problems before creating a form of zero waste management. The second research question examines the process of a good zero waste management of small hotels. This second question tries to find the best practice before offering the form of zero waste management of small hotels. The third research question determines the effectiveness of zero waste management of small hotels. In addition, this chapter also describes the expected benefits of the research for both hotel entrepreneurs who can use these results for their zero waste management and academics/researchers who can continue academic research further. Moreover, this chapter provides the scope of this research so that other researchers understand it more clearly (in terms of population, area, content and time) as well as explains the terminology of the research for terms used in this study. The last part of this chapter summarizes the structure of the research with five chapters (introduction, literature review. research methodology, analysis and findings, and conclusions, discussion and suggestions). The following content is Chapter 2 regarding the literature review that includes the theories involved with the aims of the research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The literature review is created to help find knowledge according to the study topics, firstly, in order to indicate past studies that did not study some issues, which are brought into this study, secondly, to heap search newly emerging knowledge relating to the problems of this study, and, finally, to identify research methodology and techniques invented by researchers at the past that are associated with the topics of this research.

This chapter is an overview of literature related to zero waste management of small hotels that has a positive impact towards their environment and therefore affects the image of these hotels in a great view of customers and society. The beginning of this chapter discusses the concepts of small hotels and brief definitions that describe the number of rooms and employees and the management of small hotels. The following section presents an overview of the factors that affect the zero waste management of small hotels starting from their location, finance, regulations, management, employees and customers, and the definitions of these factors are included. This chapter also discusses the process of waste management of small hotels. It starts from a discussion of the source of waste in these hotels and the amount of waste generated. Then, the zero waste management that has been popular among previous studies based on the principle of Reduce, Reuse, Recycle and Recovery (4Rs) is discussed as well as the waste management to achieve the most successful result is prioritized. Previous studies used the ISO 14001 environmental management standard, which discussed the standard-based management principle. In addition, the literature review finds and integrates Deming's Wheel Theory "Plan-Do-Check-Action (PDCA)" as the zero waste management process of small hotels.

Conceptual framework is presented as the zero waste management of small hotels that is related to all factors and affects the waste management cycle according to the hotel's policy regarding waste management that is put into a systematic and 4Rs practice. Then, an examination is conducted to find their working shortcomings that need to be improved. The overview of this chapter is presented in Figure 2.1 below.

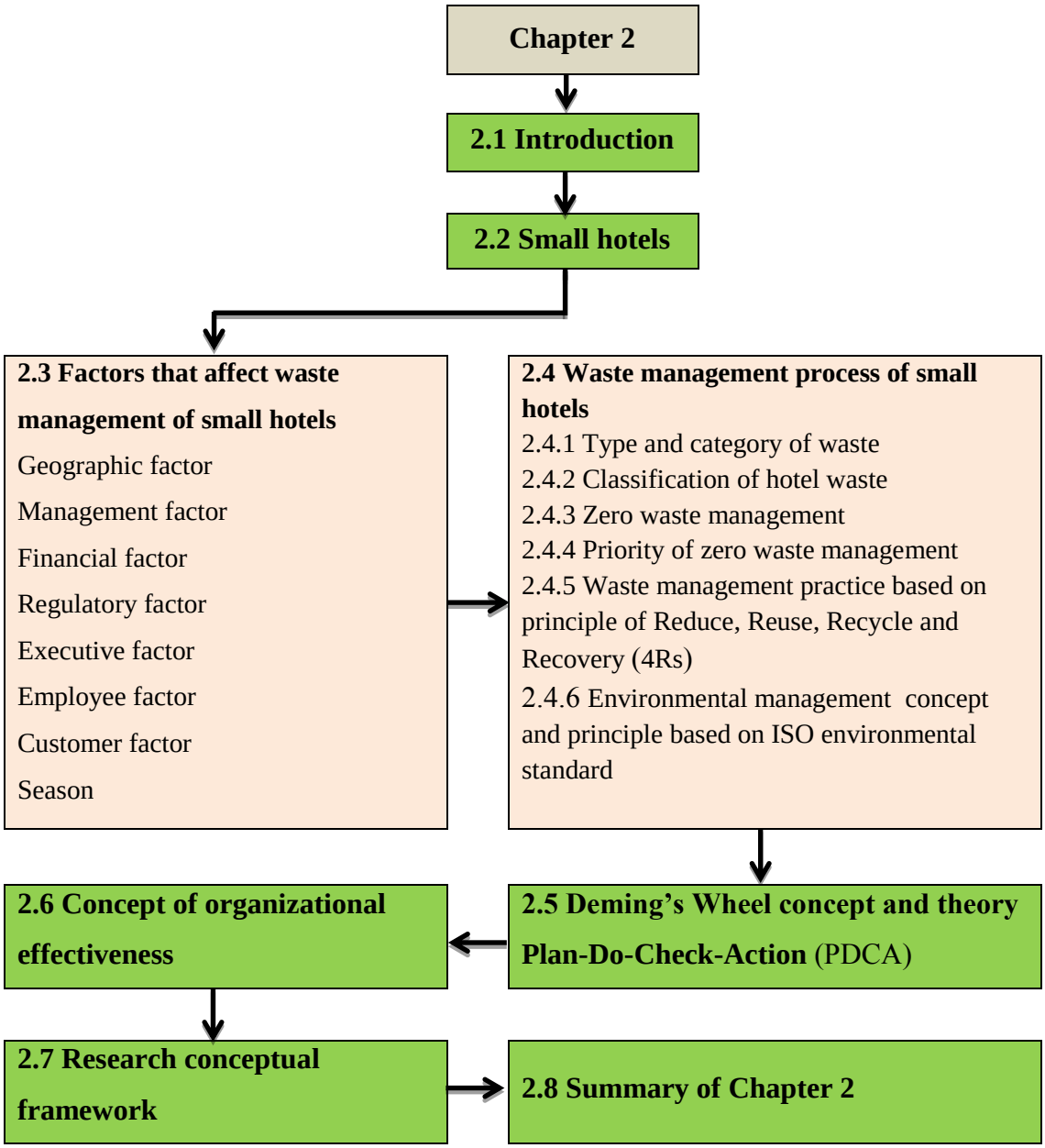

Figure 2.1 Chapter Two Structure

2.2 Small Hotel

In the past, there were many studies on the definition of "small hotel" in relation to the businesses in the service industry from 1980 to early 1990, which mostly reflected general methods of their meaning as well as the source and size of small hotels and participation in management. For example, Ganguly (1985) studied the history of small hotels while Stanworth and Gray (1991) and Storey (1994) studied the size of small hotels, including the number of rooms. In addition, the participation in management of small hotels was studied based on the concept of Harrison and Johnson (1992) and Wanhill (1990). Since then, there were numerous scholars who presented about participation in the management of small hotels. For example, Arasli (2002) stated that a small hotel could not be viewed only its income, but its physical characteristics, including location and size, must also be taken into account. Buhalis and Cooper (1998) predicted that in the future a small hotel would have a different form of management especially the number of its employees would be decreased.

Beaver (2002) discussed the participation in the administration in small hotels with a unique self-management nature. Bridge, O'Neill and Cromie (2003) explained that a small hotel is invested and established by a person or a small group of persons with direct management from its owner and that it comes with a personal nature with no officially administrative structure and external agencies may be involved or not. In addition, Morrison and Teixeira (2004) said that what a customer perceives from a small hotel is the convenience and uniqueness of such hotel. Customer service of small hotels is better than those of large ones because its employees pay attention to their customers thoroughly. Jaafar, Rashid Abdul Aziz, and Zaleha Mohd Sukarno (2012) predicted that small hotels would be more demanded by tourists because they prefer affordable prices and convenient facilities of these hotels. However, Budge, Irvine, and Smith (2008) and Runyan (2006) said that small hotels must have several factors for their survival, such as human resources management, use of technology, organizational culture, marketing management and ability of marketing competitiveness. Most importantly, these small hotels are compared to large ones in terms of their better modernization because of their better distinctive identity than

large hotels (Leonidou, Leonidou, Fotiadis, & Zeriti, 2013; Molina-Azorin, Claver-Cortes, Pereira-Moliner, & Tari, 2009).

Small hotels have a limitation on the number of employees and rooms or beds. Thomas, Shaw, and Page (2011) studied small hotels in the tourism industry. According to the order of the European Commission in 1996, the hotels are classified by the number of employees as follows: a micro hotel has 1-9 employees; a small hotel has 10-49 employees; a medium-sized hotel has 50-249 employees; and a large hotel has 250 employees or more. However, this conclusion is not universally accepted. The more important thing than the number of employees in these hotels is the service provided to the customers by their employees. Avelini Holjevac and Vrtodusic (1999) and Pine (2002) commented that a small room should have 40-70 rooms. Pivcevic (2009) and Morrison and Conway (2007) stated that the important elements of small hotels include their flexibility and variety of services with an ability to provide individualized service to their customers. Tourists often look for accommodation with a welcoming atmosphere, which can be found in small hotels. Morrison and Teixeira (2004) determined that the number of rooms available in a small hotel must be less than 50 rooms, they are classified as a three-star hotel, they offer a low-cost accommodation service, such as motels, backpacker inns and home-stay businesses, they employ fewer than 10 employees and their market is at a lower level coupled with a unique attraction for visitors to come and stay as well as quality of their service and uniqueness especially the nature-based local way of life.

According to all examples mentioned above, including the definition of a small hotel, it can be concluded that there has been a call for specific properties of a hotel, i.e. the number of room is between10-70 rooms, the number of employees is between 10-49 people, the small hotels are managed by their owner or partners, and the small hotels are advantageous in terms of their services that are accessible to their customers, which is unique for these hotels. These properties are shown in Table 2.1 below.

Table 2.1 Properties of a Small Hotel

Properties of a small hotel		Authors
Number of rooms	40-70	Avelini-Holjevac and Vrtodusic(1999) and Milohnic (2006)
	Less than 50	Morrison and Teixeira (2004)
Number of employees	10-49	Thomas (2000)
	Less than 10	Morrison and Teixeira (2004)
Affordable price		Runyan (2006) and Budge, Irvine and Smith (2008)
Managed by owner		Morrison and King (2002) and Bridge (2003)
More unique and convenient services than large hotels		Morrison and King (2002), Morrison and Teixeira (2004) and Pivcevic (2009)

The following section describes factors that affect the zero waste management of small hotels by presenting/discussing the definition and significance of seven factors studied before. Also, it will discuss the relationship of same or similar factors that influence this study, such as physical conditions and location of the hotels and employee participation and employees involved in waste management, but the definitions of these words or sentences are different. However, in this study, the researcher focuses on the zero waste management that takes place only inside small hotels, not on the waste management of other types of hotels.

2.3 Factors that Affect Zero Waste Management of Small Hotels

About the factors that influence the implementation of the policy into action, policymakers are generally not those who apply in practice. Most policies reflect a compromise between various parties, so there is no specific form of policies and it is left under the discretion in the interpretation of their objectives. Lemley and Russell (2002) commented on the factors influencing the process of implementing the policy into practice by paying attention to the relationship of the factors that affect the

performance. These factors consist of policy factors, including policy standards and objectives and resources, which are deemed external variables, while there are four internal variables that affect the performance as well: (1) communication between organizations and driving activities, (2) characteristics of institutes implementing the policy into practice, (3) political, economic and social conditions, and (4) willingness of those implementing the policy into practice. Shanklin and Somerville (1991) studied the waste management of hotels located in developed countries and concluded that the effective introduction of the prioritization in the establishment of strategic plans for waste management in the country is based on various factors, including geographic conditions, population density, transportation systems, economic and social conditions, and environmental laws or regulations of that country. Furthermore, previous studies on the factors affecting the waste management of the hotels divided these factors into eight areas: physical, waste management, financial, regulatory, executive, employee, customer, and season factors, as detailed and summarized in Table 2.2.

2.3.1 Hotel Location:

Storage and facilities needed in waste management must be correlated with the hotel's transport system or be convenient for transport and storage. For example, Altaf and Deshazo (1996) noted that for a hotel adjacent to the mountain or sea, its waste transport for outside disposal is problematic so the hotel needs to find its best waste management within the hotel as much as possible prior to external disposal. Ogawa (1989) described that the hotel located in the city area has a business advantage, but its disadvantage of waste management is accessibility, storage or destruction that disturbs both environment and community. Also, Sila and Ebrahimpour (2005) said that the hotel located next to the sea would be influenced by monsoon winds that blow waste into the hotel's beach and the amount of this waste cannot be controlled. Addition, supported that the road or access way to the hotel or the channel used to convey materials and products into the hotel, including the waste conveyance for disposal, whether by roads and waterways, and access time, differently take part in the emergence of waste. In addition, there are studies on the physical conditions of hotels and tourism that affect the emergence of hotel's waste.

Furedy (1997) confirmed that the amount of wet waste, such as fruit peels, is higher during the fruit season and that even in the tourism season the number of tourists in the hotel's location dictates the amount of waste. Thaman, Morrison, Morrell, and Thaman (2003) said that it is inappropriate for waste management when a hotel is adjacent to the community and the disturbance towards the community must be taken into account when disposing of the waste. Similarly, a hotel located next to the sea or river must be careful of not discharging its waste into such river and sea. The locations of waste management facilities as well as of hotel itself affect the transport for waste management. Hotels adjacent to the sea/mountain experience difficulty in conveying their waste. Waste management appropriate to this type of hotels is thus to minimize the amount of waste before destroying it physically. On the other hand, for a hotel located in the city area, conveying the waste for destruction is the best way for waste management because it cannot burn its waste because of environmental and community impacts.

2.3.2 Waste Management:

Waste management method appropriate to the properties of such waste results in an effective management and benefit. According to the literature review, there are three sub-points to consider. First is an appropriate waste management method for hotels. For example, Sugar, Kennedy, and Hoornweg (2013) proposed a method of waste management by using the principle of (1) Reduce is to refuse or avoid goods or packaging that may create a waste problem or to use products that their packaging can be returned to their manufacturers, (2) Reuse is to utilize available resources worthily by reusing what were used and can still be used again in order to reduce the use of new resources as well as to reduce the amount of waste, and (3) Recycle is to process materials, such as paper, glass, plastic, aluminum and steel, by different methods to reuse these materials again. In addition to reducing the amount of waste, this can reduce energy consumption and environmental pollution. Second is the insufficient number of bins. Bartone, Leite, Triche, and Schertenleib (1991) discussed the insufficient number of bins used in the classification of waste by category. Bins used in the hotels are classified by type of waste by using different colors or specifying the type of waste with a tight lid as well as are resistant to sunlight and general

environment. In addition, these bins can be moved to the garbage trucks or pushed to discard the waste. In addition, Moore, Gould, and Keary (2003) said that the separation of waste by type has an advantage to help reduce the amount of waste because the separation of reusable articles renders them not a waste. This practice also increases safety because toxic waste is separated out to special care. Finally, another benefit of separating the waste is to promote tourism because the separation of waste by bin provides an orderly and beautiful atmosphere. Third is the use of technology inappropriate for waste management. Midwall, Ambrose, Pichard, Abedin, and Herman (1982) discussed the technology of waste management to achieve the clean waste management technology as the ultimate aim, including the use of compost, incinerator, landfill system, and layout of the hotel, and the creation of green space in different areas of the hotel. Also, Lohani (1988) said that the use of these three forms of technology may lead to the final management of waste cycle, i.e. composting, incineration and landfill of waste based on its properties. However, a good waste management process at its source and the preparation of composts can produce less waste that does not affect the final waste management, i.e. incineration and landfill, which have an environmental impact.

2.3.3 Finance:

Although the small hotel business considers that the waste management is a matter of increasing the costs and expenses that have to be invested in the system as well as of necessary technology, maintenance and environmental care, which may not be worth if this waste management is implemented, if the hotels improve their management strategies by implementing the waste management system in the long run, they can have the ability to compete over their rivals as well as can reduce their expenses and be friendly to society.

In addition, Lohani (1988) indicated that the entrepreneurs of small hotels are companies with a limited financial resource and they therefore cannot develop their long-term and environmental activities. Ali and Snel (1999) studied the importance of management capital as a factor that helps to achieve the goals established because the activities in waste management need an investment to be successful. Thaman, Morrison, Morrell, and Thaman (2003) said that the hotel entrepreneurs focus

exclusively on the financial factor because their hotels need to raise capital. Most small hotels do not plan about the source of funds for the development of waste management during their construction period; rather they usually keep the profits from revenue from customer services or borrow the money for spending in this waste management. Also, Steckley and Doberstein (2010) mentioned that the hotel business needs to focus on the waste management system all the time because there are more or less wastes generated in the hotels depending on their financial factors. Contrarily, Cointreau (1987) argued that in addition to reducing environmental and ecological problems within the hotels, a good waste management can also reduce costs and increase revenue of their hotels in a long term. Moreover, Thaman, Morrison, Morrell, and Thaman (2003) pointed out the issue of utilizing the waste to ensure its maximum benefit by promoting the waste management and utilization activities to stimulate the more use of waste as well as to increase the value of waste that can result in a continuous reduction of waste to be disposed of or treated and a reduction of disposal cost, including an increase of revenue from the sale of waste.

2.3.4 Regulation:

The hotel's waste management can be regarded based on external regulations; for example, a hotel construction according to the standards must comply with the rules of environment-related authorities as external regulations, such as ISO 14001 environmental standard, green hotel standard of the Pollution Control Department, or rules of the community where the hotel is located (Leitmann, 1995), while internal rules of the hotels regarding their waste management are only applied to such hotels.

For example, Leitmann (1995) mentioned about the hotel's waste management regulations. These regulations ask for cooperation from, rather than enforce, all employees of the hotel, which intended to control the emergence of waste. This starts from helping to reduce the amount of waste by the Purchasing Department that buys only environmentally friendly products in bulk each in order to reduce the amount of packaging before reusing them for their maximum benefit. However, Moore, Gould, and Keary (2003) proposed that too many regulations enforced in a hotel can affect the hotel occupancy so asking for cooperation is a good solution. In addition, said that the hotel management should have clear goals to control the amount of waste

generated, promote waste management activities, and support appropriate regulations ranging from reduction, utilization to disposal of waste to be followed by various departments.

2.3.5 Executive Management/Hotel:

Hotel owners should have a good attitude in regard to waste management that an environmentally friendly hotel can exist by volunteer, not by force of law or society. Zurbrugg (2002), Indrayana and Silas (1993) discussed the executive factor that for the waste management of the hotel to achieve the policy and targets established, the hotels need to determine the strategies and measures for policy implementation, especially the waste reduction and utilization must rely on relevant measures of management, regulations, support and investment. In addition, Nzeadibe (2009) studied the coordination of various communication methods between hotel owners/executives/supervisors/employee of all departments in order to transfer and further existing knowledge into its maximum benefit and to jointly improve both the customer service system and the coexistence of all employees, including performing common activities. Furedy (1997) stated that hotel owners/managers focus on a holistic work because it will make the working system that depends on a coordination of employees in various departments more effective. Furthermore, Thaman, Morrison, Morrell, and Thaman (2003) said that an important impulse that makes hotel executives support the waste management is the benefits the hotels will obtain, including their cost reduction because the waste in the system is less, promoting a positive image of the hotels in terms of natural resource and environmental conservation, and making their business widely recognized with an opportunity to increase their competitiveness.

2.3.6 Employee:

All hotel employees are involved in waste management and knowing their roles with a vigilance and awareness of waste classification and appropriate discard results in the reduction of waste. In addition, all employees are aware of the type of waste that occurs in their hotels in particular in the parts they are responsible; for example, kitchen/canteen employees generate food waste, front employees generate

paper waste, and housekeeping employees generate solution container waste (Weng & Fujiwara, 2011). However, Moore, Gould, and Keary (2003) mentioned that knowing the properties of each type of waste can result in the proper separation and management/disposal of waste. A good practice of waste management can be properly established by raising the awareness of waste separation and creating the correct understanding on the types of waste via waste classification training (Ali & Saywell, 1995). In addition, Ewing and Cervero (2010) said that the employee participation is part of a proper waste management by sharing their ideas to obtain the correct practice of waste management, experimenting and finding an appropriate way, deciding to conclude the correct waste management practice, solving the problems, receiving the benefits, and evaluating the experiment results. On the other hand, if employees lack of cooperation as defined by executives, the goals set cannot be achieved and there will be conflicts with the organization. However, Van Beukering (1994) discussed in his research that the health care for employees who work closely with waste management must be given priority. In particular, toxic waste management must come with protective measures to deal with the smell of waste, especially wet waste that has accumulated a large amount of methane or hydrogen sulfide. Those inhaling these gases excessively can have a problem of respiratory system from sinus to lungs, which can cause poor mental state. Waste separation employees are at risk and they can protect themselves by wearing a mask and gloves together with cleaning their body before and after completion of their work. Hotel employees can also encourage their customers to reduce the amount of waste. Medina (1993) said that the cultivation of environmental conservation habits and awareness of the obligation to reduce waste can be achieved by gradually changing the behavior into a habit, such as offering a cloth bag to customers to use during shopping, proving the Green Card service for bed sheets and towels, and not providing some services, such as toothbrush and toothpaste, but soap, shampoo and shower gel still need to be provided as a separate set. The hotels must consider that such plan is not yet fully operational because they always need to take into account the comfort of their customers. Nzeadibe (2009) stated that the Waste Reduce, Reuse and Recycle activity aims to separate and recover the waste by using the available resources at their best value, which will be useful in budget and energy saving in waste management. In addition to

a good and clean environment, the hotels will also obtain the revenue from waste separation.

2.3.7 Customer:

A strategy that encourages hotel customers to provide their cooperation in the waste management is a variety of communications to create their recognition, such as publications, campaign billboards, brochures, posters, and electronic letters, with an aim to raise awareness and realization of common behavior in waste management (Ali & Saywell, 1995). In addition, Weng and Fujiwara (2011) said that current hotel customers have an attitude, feeling, perception and awareness on the environmental values and the threat of global warming towards the tourists as well as are ready to prevent such threat with the proper knowledge, understanding and method of waste management. Ali and Snel (1999) supported that current hotel customers have environmental conservation information and learn activities held by the hotels to reduce the amount of waste and to discard the waste into the bins provided. Also, Byer, Hoang, Nguyen, Chopra, Maclaren and Haight (2006) presented an opinion that customers can play an important role in the joint management of recycled waste, such as separating food waste from those that can be recycled before being discarded into the hotel's bins. Thus, the hotels are required to provide more bins for recyclable materials and for more convenience for their customers, such as placing the bins at the elevators or in the room. Ali and Snel (1999) pointed out that customer attitudes affect the environmental problems with positive change, such as many hotels reported that the rate of customer participation in the recycling of hotel's waste increased significantly.

2.3.8 Season:

Tourism seasons can affect the hotel's waste management in two aspects. Firstly, Moore, Gould and Keary (2003) stated that a period suitable for tourism is based on the season appropriate for that place and this is different in each country, which affects tourist traffic, such as there are more tourists in high season and few tourists in low season. Steckley and Doberstein (2010) added that the tourism season is a short time of long weekends and festivals, such as the New Year period, called

peak season when travelers prefer to go there. Second is related to the seasonal factor affecting the waste management of the hotels, i.e. local season. Ewing and Cervero (2010) stated that the seasons can much affect the change in the amount of waste; for example, in the fruitful season there is a larger amount of waste from fruit peels and seeds because of more consumption of tourists. Weng and Fujiwara (2011) said that the fall can affect the amount of waste generated in the hotels located on natural forests and the monsoon season causes of the generation of waste of the hotels located near the sea. According to previous studies, various factors can be synthesized and used as the conceptual framework to study the factors in the zero waste management of small hotels located on the southern shore of the Gulf of Thailand. It can be seen that there are factors supporting the possibility and/or the opportunity to accomplish, including the knowledge about waste management, perception about waste management, cooperation of hotel employees, attention to effective waste management of the hotel owners/managers or those involved, benefits that the hotels will obtain from waste management, and enforcement of rules/measures to maintain the cleanliness of the hotels. These factors are obtained from previous studies and the researcher applies them in different contexts.

Table 2.2 Factors that Affect Zero Waste Management of Small Hotels

Factor	Sub-Factors	Authors/Year
hotel location	Location	Lohani (1988), Ogawa (1989), Sumardjito and Sutisna (1993) and Altaf and Deshazo (1996)
	Access	Lohani (1989), Ogawa (1989) and Furedy (1997)
	Climate	Silas (1995) and Thaman, Morrison, Morrell and Thaman (2003)
	The area for waste management	Lohani (1988) and Moore, Gould and Keary (2003)
Waste management method	How to manage waste	Maniatis, Vanhille, Martawijaya, Buekens, and Verstraete (1987), Bartone (1991), Cervero (1995), Dahlan and Hainsworth (Eds.) (1995) and Moore, Gould and Keary (2003)
	Rubbish Bin	Johnson (1992) and Moore, Gould and Keary (2003)
	Technology	Midwall, Ambrose, Pichard, Abedin and Herman (1982), Lohani (1988), Bartone (1991) and Sugar, Kennedy and Hoornweg (2013),
	Waste separation	Furedy (1994) and Furedy (1997)
Finance	capital	Cointreau (1982), Lohani (1988), Ogawa (1989), Dahlan and Hainsworth (Eds.) (1995), Ali and Snel (1999)and Thaman, Morrison, Morrell and Thaman (2003)
	The high costs	Cointreau (1987), Arlosoroff (1991), Bartone (1991) and Johnson (1992)

Table 2.2 (Continued)

Factor	Sub-Factors	Authors/Year
Regulation	Enforcement	Sakurai (1990), Muttamara (1994), Leitmann (1995) and Moore, Gould and Keary (2003)
Excutive	Interest	Furedy (1997) and Zurbrugg (2002)
	Planning	Cervero (1995), Thaman, Morrison, Morrell and Thaman (2003) and Nzeadibe (2009)
	Attitude	Sicular (1992), Indrayana and Silas (1993), Van Beukering (1994) and Furedy (1997)
	Management	Cointreau, Gunnerson, Huls, and Seldman (1984), Bartone (1991) and Sicular (1992)
	Coordination between management and employees	Dahlan and Hainsworth (Eds.)(1995) and Thaman, Morrison, Morrell and Thaman (2003)
Season	Season	Moore, Gould and Keary (2003) and Steckley and Doberstein (2010)
	climate	Ewing and Cervero (2010) and Weng and Fujiwara (2011)

Table 2.2 (Continued)

Factor	Sub-Factors	Authors/Year
Employee	Knowledge about waste management.	Sakurai (1990), Ali and Saywell (1995), Moore, Gould and Keary (2003) and Weng and Fujiwara (2011)
	participation	Arlosoroff (1985), van Beukering (1994) and Ali and Snel (1999)
	Encourage customers to reduce waste	Nzeadibe (2009)
	Safety in waste management	Medina (1993) and Dahlan and Hainsworth (Eds.)(1995)
	Conflict of interest	Poerbo (1991), Indrayana and Silas (1993), Noor (1994), Furedy (1997) and Moore, Gould and Keary (2003)
Costomer	Good attitude	Ali and Snel (1999) and Moore, Gould and Keary (2003)
	Awareness	Ali and Saywell (1995) and Moore, Gould and Keary (2003)
	cooperation	Ogawa (1989) and Ali and Snel (1999)

The next section will explain the types of waste generated in the hotels and indicate the amount of waste that takes place in various departments of the hotels and the classification of hotel waste. It also mentions the definition, importance and effect of activities on the generation of waste and on this study.

2.4 Waste Management Process for Small Hotels

The study on the waste management process of the hotels starts seperated by category and type of waste generated in the hotels in order to know what place where it is generated, such as most wet wastes come from the kitchen and dining room. In addition, there is an examination on the amount of waste generated in the hotels separated by type, which indicates separate and clear tables. Moreover, the method or best practice for waste management is studied, which covers the zero waste management based on the principle of Reduce, Reuse, Recycle and Recovery. Then, the study is conducted on the concept or theory used in the zero waste management, i.e. PDCA theory developed by Deming together with the ISO 14001 environmental standard. The final section describes the good process of waste management in small hotels as detailed below.

2.4.1 Types of Waste in Hotels

Service industry involved with customer service activities, such as hotels, bars and restaurants, generate large amounts of waste with a negative impact on the environment. The waste generated from these service activities cannot still be managed well enough (Bohdanowicz, 2005; Silvennoinen, Katajajuuri, Hartikainen, Jalkanen, Koivupuro, & Reinikainen, 2012). From past studies on waste management focused on the type/category of waste generated by service activities in the hotels. However, Bohdanowicz (2005) studied the sources of waste generated in the hotels and discovered that most wastes from customer rooms are dry waste, such as papers, glasses and cans of soda, from kitchen or banquet rooms are food waste and beverage bottles and cans, from hotel's office are recyclable waste, such as papers, paper boxes, plastics, metals, foams and glass bottles, and from shops and other businesses located in the hotels. Generally, waste from services in the hotels includes both wet and dry

waste. Most wet wastes consist of food scraps, which are accounted for more than 50% of waste generated from service activities in the hotels. Wagh (2008); Thomas, Dacombe, Maycox, Banks, Khan, and Slater, (2007) explored the origin of the products used in the hotels before they become waste in various departments, such as in guest rooms, kitchens, restaurants, bars, front reception and other areas of the hotels. This waste can be divided into different types, including papers, cardboards, plastics, metals, glasses, cloths, woods and wet waste (Table 2.3). In addition, Zein, Wazner, and Meylan (2008) mentioned the toxic waste occurred in the hotels, such as oil from the kitchens or restaurants, chemicals, pesticides, batteries, fluorescent light bulbs from the Maintenance Department, and cleaning chemicals from the Cleaning Department. Moreover, it is predicted that in the future there will be an increased amount of both toxic and non-toxic waste generated in the hotels.

Currently, hotel customers see the importance of waste management, and more importantly, of reducing the amount of waste by themselves because in an one-day stay they generate the waste about one kilogram per person per day (Bohdanowicz, 2006). In addition, according to the report by Radisson in 2002, the average of waste generation by customers who stay in the hotels was. 3.1 kg per one-night stay (Radisson SAS, 2003). Smith, Farrah, and Goodwin (1994) reported that about 50-60 percent of the waste generated by hotel customers can be reused again. Stenmarck, Jorgen Hanssen, Silvennoinen, Katajajuuri, and Werge (2011) also reported that a good management of waste generated in hotels can reduce the amount of such waste up to 50 grams per customer per night (Table 2.4). The results show the amount of organic/food waste decreased over the years especially in the United States. As for the trend during 1900, the amount of paper and plastic packaging increased, but the amount of organic/food waste was less. This partly due to the increased standard of living of the USA (Louis, 2004). The number of hotel rooms serviced in the United States increased from 45, 020 to 53, 500 during 1900-2000 (Zheng, 2014). The second part of Table 2.3 shows that the waste daily generated in the hotel rooms is 0.91 kg per day, while the dining rooms and kitchens generate the waste about 0.45 kg per customer's meal. Townsend and Kahn (1991) reported that the waste daily generated per room is between 1.81 to 3.18 kg. Losanwe (2013) reported that the waste from hotel rooms is one kilogram per day and the rate of waste

generation depends on the type of hotels, customer attributes, activities of the hotels, and occupancy rate (Snarr & Pezza, 2000). According to previous studies, the average amount of waste generated in hotel rooms is up to 0.45 to 0.91 kg per day per room. The last part of Table 2.3 describes the waste generated from the dining rooms or kitchens of the hotels that can be recycled or fermented for its utilization up to 95% of the waste totally generated, It is clear that the amount of organic/food waste is double more than other types of waste generated in the hotels. This part also compares the organic/food waste between Malaysia and Chicago and indicates that Malaysia has the more amount of organic/food waste than Chicago. This can be seen that organic/food waste is generated in developing countries (Hoornweg & Bhada-Tata, 2012).

Table 2.3 Types of Waste from the Hotel

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

Sourch: Zein, Wazner, and Meylan, 2008.

Table 2.4 Waste Arising from the Hotel

Reference	Study location	Study period	Waste quantities/calculation
Hall and Howe (2012)	UK	2009-2010	41% food waste, 13% paper, 9% cardboard, 10% plastics, 14% glass, and 13% other
Parfitt (2010)	UK	Not dated	37% food waste, 18% paper, 7% cardboard, 15% plastics, 10% glass, 13% other
VanWaning (2010)	Chicago	2009	60.3% organic waste; 19.6% paper; 6.7% plastics; 4.1% construction & demolition waste; 6.2% glass; 1.8% metal; 0.8% textiles; 0.4% beverage containers; 0.1% inorganics
Alexander (2002) and Evans (2005)	LosAngeles	1991-1993	46% food waste, 25.3% paper, 11.7% cardboard, 6.7% plastics, 5.6% glass, 4.5% metals
Majid (2007)	Malaysia	2006	71.73% organic waste (food wastes); 5.77% paper; 8.06% cans; 5.07% plastics (bottles/bags); 2.68% glass; 5.13% yard wastes; 1.56% other
Winter and Azimi (1996)	New York	Not dated	39.9% paper, 27.8% food/organics, 7.6% glass, 7.0% plastic, 6.7% yard waste, 6.1% metal, 4.3% other, 0.2% hazardous waste
Townsend and Kahn (1991)	Florida	1990-1991	Average rate of waste generation during the study ranged from 60.2 kg per room per month for the Comfort Inn to 99.9 kg per room per month in the upscale Hilton at Walt Disney World Village
Shanklin and Somerville (1991)	Toronto	1990	46.4% food waste (defined as leftovers and returns from restaurant), 26.5% glass, 11% newspaper, 9.17% cardboard, 7% plastic

Source: Pirani and Arafat, 2014.

2.4.2 Classification of Waste in Hotels

The classification of waste must be done under a system of waste separation by type based on its components with the aim to reuse such waste. This can start at its source by placing a container properly and establishing a collection system efficiently. Gardiner (2003) discussed the categories of waste that can be divided into four major categories. First is biodegradable waste or readily rottenable and biodegradable waste that can be fermented to make fertilizers, such as vegetable chips, fruit peels, and food and meat chips. Second is recyclable or usable waste, including packaging waste or materials that can be recycled for new uses, such as glasses, papers, beverage cans, plastics and metals. Third is general waste other than biodegradable, recyclable and hazardous waste and is difficult to be biodegradable as well as is not cost-effective for recycling, such as candy plastic wraps, plastic bags containing detergents, and instant noodle packaging. Fourth is hazardous waste that is waste contaminated with hazardous substances, explosives, inflammable substances, oxide and peroxide substances, toxic substances, and radioactive substances, including materials that may cause an impact to environmental quality or harm to humans, animals, plants or objects, such as fluorescent lamps, flashlight or mobile phone batteries, and bathroom cleaning solution bottles or tubes.

On the other hand, Stoller (2005) argued that the classification of waste in hotels should have three separate types of waste, i.e. recyclable or usable waste, food waste, and toxic waste. In addition to these three categories of waste mentioned above, there are other types of waste, such as waste from toilets and debris from the repair of buildings and facilities, leaves and grass clippings, and cooking oil. Additionally, Chanen (2004) mentioned five categories of general waste, i.e. biodegradable or sellable waste, general waste or waste that is difficult to be biodegradable and not worth to be recycled, material waste or waste from activities, such as branch trimming and metal scraps from construction waste, and toxic waste.

2.4.3 Zero Waste Management (ZWM)

The hotel is an important service establishment in the service industry and previous studies have shown that hotels generate different forms of waste, which is deemed a serious problem. Landfill, incineration and composting have been methods used to manage waste, but the ZWM has become a subject that is recognized as being effective for waste management in terms of use of natural resources, economy and ethics (Wilson, Velis, & Cheeseman, 2006). Couth and Trois (2012) asked the government to promote this ZWM within the sustainable tourism management.

According to UN-HABITAT (2010), ZWM is derived from the basic concept of environmental recycling that was successful in 1980. ZWM includes the design and management of products and processes to reduce the amount and toxicity of waste and materials, the conservation of recourses, and full recovery without any incineration or bury. Zaman (2014) studied the waste management in different cities by comparing various forms of waste management, integration, recycling, technologies, participation of stakeholders, and official and unofficial sustainable development management. The results concluded that every study on waste management must be based on local conditions and prevention methods and stakeholders must cooperate in waste management. This means that a good waste management must be based on preventing the products from becoming the waste as minimum as possible (Bovea & Powell, 2006).

ZWM has been investigated in many studies. For example, Murray (1999) studied the ZWM on the cycle of product design and process establishment to avoid the generation of final waste and to return the waste to the nature as much as possible. Sarkis and Dijkshoorn (2007) mentioned the concept of worldwide zero waste disposal based on a design of products that can be disassembled for recycling after use. This zero waste disposal does not mean no waste generated, but it is involved with the management of product life cycle to product as less waste as possible. The scope of zero waste management is based on many concepts, including reduction of production, design, repair, reuse, and marketing stimulation to make customers more demand for recycled products. Couth and Trois (2012) stated that the ZWM is developed from concerns about the increased consumption patterns that cause the problem of excessive waste generated, the global warming and resource depletion,

economic opportunities, new regulations, and advanced technologies. This ZWM focuses on the principle of 3Rs (recycling, reducing and reusing) as the core of the integrated waste management presented in 1990 (Geiser, 2001). The concept of ZWM is involved with many practical and theoretical measures in order to use natural resources as worthily as possible. It starts from the selection of resources to create quality, environmentally-friendly and biodegradable products that when not in use can be reused for other applications or repaired after they are used, creation of working opportunities, and emphasis on businesses that are responsible for producing products and returning the materials to their manufacturers after use (Dileep, 2007). Phillips, and Read (2000) stated that the operations and activities of the hotel business should focus on reducing the waste, such as reducing, redesigning, reusing, refilling, regenerating, recycling, repairing, reclaiming, restoring, recharging, remanufacturing, and reselling. Murray (1999), said that the strategy is necessary for defining the target of ZWM is the responsibility of product manufacturers, which means that these manufacturers must be responsible for all stages of the product life cycle ranging from production, use and disposal of the products.

2.4.4 Priority of Zero Waste Management (ZWM)

The priority of ZWM is about avoiding and reducing the generation of waste before recycling and disposal. In short, this principle is based on reducing, reusing and recycling, or 3Rs that is used in a campaign to reduce the amount of waste. For example, Sarkis and Dijkshoorn (2007) stated that the prioritization of unused material management is a good option (reuse, recycle, energy recovery and disposal). Both government agencies and private organizations that have contributed to waste management should inform the implementation of hierarchy strategy of waste management to reduce the amount of waste before disposal. Seigneur et al. (2000) noted that many countries have applied the priority principle of waste management to define their policies by focusing on reducing the amount of waste, reusing and recycling. Then, such waste is used for energy production and disposed of by landfill as the final step. 2000 was the first year when the Japanese government began developing their country into the sound material-cycle society and issued several laws about 3Rs, including the basic law regarding the establishment of this sound material-

cycle society. This law prioritizes the reduction, reuse and recycling. Ichinose, Higashida, Shinkuma, and Kojima (2013) stated that this principle is the basic idea to help decide and choose the best management method that does not cause harm to the environment and is used as a tool to initially consider the community waste management by ordering from more to less environmental impacts, including waste reduction, reuse, recycle, disposal with energy recovery, and final disposal, which is likely to cause the environmental impact at most.

The hierarchical concept of waste management in the service industry has been studied for many years. For example, Cummings (1997) developed a hierarchical model of waste management in service business and proposed five steps for waste reduction: step one is committed to reducing the amount of waste as minimum as possible; step two is to purchase environmentally friendly products; step three is the most effective use of products; step four is to reuse then waste; and step five is to separate and recycle the waste. However, these five steps must be on a voluntary manner and a positive attitude towards the operation in waste management of such hotels. Creating the preparedness for employees with motivation and intention regarding waste management in the hotels is an extremely important behavior and the training on the operations to reduce the waste should be provided to employees in hotels. Baker and Vandepeer (2004) also said that the principle of hierarchy can be effectively used as a potential option for waste management of small hotels and that the hierarchy of waste management depends on different options (prevention, minimization, reuse, recycle, energy recovery and disposal). The process of waste prevention or disposal must start from the waste reduction in the product lifecycle and the reuse as the first step. Before recycling, the value of such waste must be foreseen. The final and very popular step is landfill and incineration.

However, the hierarchy of waste management must be involved with composting the organic waste as a way of sustainable organic waste management. Nevertheless, Webster, Parish, Pandya, Stern, Clarke, and Gaston (2000) studied the stages of waste management in hotels by means of recycling and composting, which are steps that cause less harmful effects to the environment and that are good for human health, use of valuable resources, and model development. For example, the waste management of hotels in Egypt is a good practice with nine steps: (1) recycling policy,

(2) waste inspection, (3) reuse, (4) recycle, (5) practice review and performance, (6) separation of waste at every source of origin, (7) purchasing of environmentally friendly products, i.e. products must be recyclable after use, (8) employee cooperation, and (9) customer cooperation in waste management. However, the development of recycling process after the occurrence of waste is not as important as focusing on waste prevention. In addition, Abu-Taleb, Alawneh, and Smadi (2007) said that the problem found in the waste management in the hotels is mainly involved with disposal area and time, such as waste that must be eliminated first is often rotten and smelly.

Also, Bacot, McCoy, and Plagman-Galvin (2002) added that what the entrepreneurs of small hotels often lack is the data of waste, time and motivation to implement environmental practices. Hallberg (1989) stated that there are four components of an integrated waste management. First is to reduce the amount of waste at its source of origin, second is the reuse, third is the disposal by incineration, and fourth is landfill. These components serve as a proper and effective process in solving the waste problem. These components work to support each other without conflict; for example, disposal by incineration serves to dispose of the waste with an appropriate heat value after the waste is classified to be reused without using the recyclable materials as fuel in such incineration. In addition to the combination of these components, they must also be prioritized by the reduction of waste at its source of origin. In this case, the reuse has priority over disposal by incineration and landfill. Bohdanowicz (2005) mentioned that an effective waste management relies on a number of ways to work together from the beginning to the end as well as takes into account various factors involved, or integrated waste management. This waste management is based on the characteristic of waste and on the conservation of natural resources and energy, including protection of quality environmental by means of source reduction, reuse, recycle, recovery, and disposal, respectively, as shown in Table 2.5 and Figure 2.2.

The prioritization of waste management is developed from the concept of integrated waste management mentioned above and consists of four steps. First is the reduction of waste at its source and the reuse, which includes the reduction of both quantity and toxicity of waste that are important elements causing an impact on the environment and quality of life, as well as the reduction of waste at its source by

designing, manufacturing and using environmentally friendly or reusable packaging. Second is the recycle, which includes the processing of organic waste into fertilizer (recovery). In addition to the reduction of the use of natural resources, it can also prevent the disposal of usable materials by incineration or landfill, extend the lifetime of disposal system, and decrease the environmental impact. The benefit of this step is to minimize the waste to be disposed of. Third is the disposal by incineration aiming to reduce the amount of waste that must be landfilled and the by-product is the generation of burning energy so it is suitable for local with waste that cannot be reused in bulk. The final stage of this integrated waste management is the landfill. Despite the least importance, the landfill is still necessary for management of waste that cannot be reused.

For reasons mentioned above regarding the hierarchy or process in the waste management in hotel business, it can be concluded that the principle of 4Rs is basically needed to build the standard of waste management hierarchy for of hotels as shown in Table 2.5 and Figure 2.2.

Table 2.5 The Priority of Waste Management in Hotel

Source	Step waste management					
	Reduce	**Reuse**	**Recycle**	**covery**	**Retink**	**Refill**
Nakasima, Kojima and Gupta (2012)	✓	✓	✓			
Abu-Taleb, Alawneh and Smadi (2007)	✓	✓	✓			
Bohdanowicz (2005)	✓	✓	✓			
Baker and Vandepeer (2004)	✓	✓	✓	✓		
Bacot, McCoy and Plagman-Galvin (2002)	✓	✓		✓		
Seigneur (2000)	✓	✓	✓			✓
Webster (2000)	✓	✓	✓		✓	
Cummings (1997)	✓	✓	✓			
Hallberg (1989)	✓	✓	✓	✓		
Total	**9**	**9**	**8**	**3**	**1**	**1**

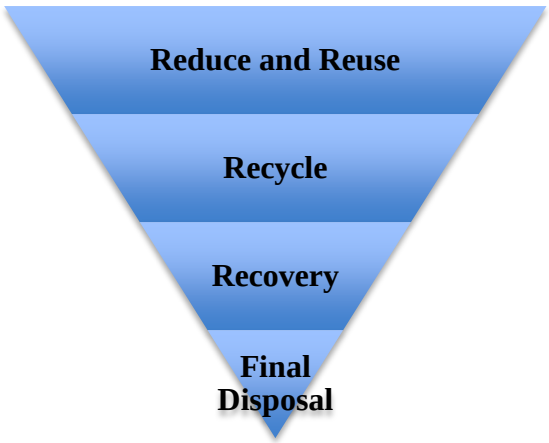

Figure 2.2 The Priority of Waste Management

2.4.5 Waste Management Practice Based on 4Rs (Reduce, Reuse, Recycle and Recovery)

How to manage the waste and by what way is based on the awareness of waste data, including type and amount of waste, in order to learn plan the utilization of waste appropriately. The best practice for waste management of the hotels based on the 4Rs principle is developed from previous studies used in this study to serve as a guideline to create an action plan as part of the source waste management of small hotels. The important aim is to reduce the amount of waste generated at the hotels before disposal as minimum as possible, and reuse, recycle and recover the waste as detailed below.

2.4.5.1 Best Practice for Waste Reduction at its Source

Reduce refers to the reduction of waste that may occur, such as using a basket instead of a plastic bag (reducing material volume) and an attempt to use the products contained in a big packaging instead of a small one in order to reduce the amount of packaging that will become the end waste (Cummings, 1997). There are popular ways of waste reduction used in the hotel business. Min and Galle (1997) said that the reduction of waste of small hotels must from their procurement. Green procurement is an operation focusing on the environmental awareness to reduce the amount of waste at its source as well as on the enhancement of the recycling potential. In addition, Mostafa (2007) found that consumers who are highly conscious of environmental conservation are likely to buy environmentally friendly products, but

they information or encounter an obstacle of environmentally friendly products. In addition, there are many guidelines regarding the selection of environmentally friendly products. For example, Warner and Ryall (2001) mentioned that a green procurement is created by local officials involved in waste management who provide data, whether advice or procurement manual, to employees of small hotels. They also found the obstacle when the training is provided to these employees but it is not published into the hotel's procurement policy. Curlo (1999) indicated a good practice in prevention of various types of waste, such as avoiding unnecessary packaging (purchasing products in bulk/large size).

However, only 10% of products in the United States are environmentally friendly products, while 50% of consumers in the United States are classified as green consumers. There were also reports that the products the green consumers want to buy are still at a low level once prioritized towards environmentally friendly products. Phillips (1999) reported the reduction method in hotels to reduce the amount of waste by requiring that the hotel's procurement must be involved with environmentally friendly products, such as ordering large quantities to reduce packaging because waste reduction increases the recycling potential in the next step. Moreover, Hsieh (2012) stated that the recycling process must deny or avoid the objects or packaging that can become waste, such as foam boxes, plastic bags, foam or other types of toxic waste, as well as avoid buying the products wrapped by several layers of packaging and buying disposable or short-lifetime products. Furthermore, it does not support shops that store and sell the products with superfluous packaging and have no recalling system for used packaging. Finally, it should select larger products because they use less packaging compared to the weight of the products, which does not cause contamination of the pollutants resulting in an environmental impact since these products are reused or recycled.

2.4.5.2 Best Practice for Waste Reuse

Reuse refers to the reuse of usable materials or product packaging, such as papers, glasses, metals and plastics, at their best value because the single use can generate unnecessarily excessive waste and lose resources used to re-produce such materials (Cummings, 1997). Radwan, Jones and Minoli (2010) stated that the best practice for waste reuse or recycled focuses on an appropriate practice based on the

potential of each type of waste by focusing on not affecting the waste reuse or recycling process. It is also required to learn the utilization potential of each type of waste types, including guidelines/patterns in reusing such waste. However, the hotels buy or use the products designed to be used more than one time, such as reusable bottle packaging, repair the appliances and equipment so that they can be reused again, and reduce or suspend the lavish consumption by using the products based on their actual needs. In addition, Charara, Cashman, Bonnell, and Gehr (2011) discussed that the reuse includes the maintenance of equipment and appliances to make them more durable and long lasting, the reuse of packaging and other unused materials, such as plastic bags, cloth bags, paper bags, cardboard boxes, water bottles, milk jugs and boxes of sweets, the borrowing, renting or use of frequently and commonly used items or products, such as newspapers and periodicals, and donation or sale of supplies, such as books, clothing, furniture and other tools, and adaptation of things for other applications, such as making a chair from a car tire, a vase from a plastic bottle, and a cradle from cloths.

Trung and Kumar (2005) confirmed that the reuse refers to the reuse of packaging in the same manner without changing its original shape and this can be achieved by returning the bottles to their manufacturers for reuse. In this case, consumers will pay a deposit for such packaging and receive the deposit back if the packaging is returned to its manufacturer. Alternatively, consumers can clean and bring their empty containers to the shops to refill such containers. This waste reuse is simple and consumes minimal energy. Moreover, Morrison (1998) proposed two methods of reuse without going through the factory. First is the reuse with same method, such as reusing a used food container again, and second is the reuse with an improvement or change for new forms of utilization, such as using an empty cookie box for storing items and inventing furniture from unused wheels. According to previous studies regarding the reuse of waste, the reuse refers to the use of waste at its full potential based on the existing categories without any environmental impact. On the other hand, the reuse of hotel business should be based on the design of products for more than one time of use, such as using a cloth bag instead of plastic one, using both pages of papers, and using bottle products twice, including the repair and maintenance of equipment to be more durable.

2.4.5.3 Best Practice for Waste Recycle

A reproduction separates non-recyclable materials out of the waste and collects and uses them as raw materials for such re-production known as the recycle. This process converts the products for reuse by introducing them into a low to high technology-based process to change a used product to a new one (Bacot, McCoy, & Plagman-Galvin, 2002). Ball and Taleb (2011) said that the recycle is involved with managing unused materials that will become waste my beans of a recycling process, especially a melting process, to obtain a new material for its reuse. This converted material may be either the same or new product. In addition, Rahman, Reynolds, and Svaren (2012) mentioned that the recycle refers to a reuse without any conversion process and also means changing or improving the form or shape of unused materials for other applications. For example, a plastic water bottle filled with water again is called the reuse, but if it is cut into a can to scoop the soil into a bag or cut into a vase, it is called the recycle of plastic water bottle. Recyclable materials include glasses, water bottles, mirrors, papers, plastics, woods, metals, coppers and aluminums, while non-recyclable materials include wet waste, organic material remains, and cloths. Revilla, Dodd, and Hoover (2001) discussed that recyclable materials are materials that can be sold/donated/brought to a waste bank or egg exchange activity and then they will be returned to the recycle cycle.

Trung and Kumar (2005) also discussed that broken or damaged glass bottles will be classified by color, including clear, amber and green glass bottles. Then, the glass leftovers are put through the recycling process starting with separating them by color, removing their original caps, grinding them, putting a color removal solution to remove the color attached to these glass bottle, and cleaning and sending them to the glass bottle manufacturing factory for re-melting. Ball and Taleb (2011) said that the paper is a material that is easiest to decompose because it is made from natural wood pulp. Typically, paper is naturally biodegradable in 2-5 months, but if it is tightly buried in a pile of waste without sunlight, air and moisture for microbial degradation, it may take up to 50 years to decompose. Therefore, we should separate these paper scraps out of other types of waste for ease of storage and recycling for reuse of their best benefit. Berger (2002) argued that there are two types of plastics. First is permanent or thermoplastic plastic that is hardened by heat without reversing

and that can be molded into various shapes of products. It is hardened by heating within the template and it has a high stability because it cannot be melted again. Plastics in this group are thus classified as non-recyclable plastics. Second is reusable or thermosetting plastic that is melted by heat and hardened when the temperature drops.

This plastic is classified as recyclable plastic. In order to make it easier to separate the different types of plastic packaging to be efficiently recycled or re-processed, a symbol is widely used on their packaging. For example, PETE (Polyethylene terephthalate ethylene) is made as non-alcoholic drink bottles and vegetable oil bottles, HDPE (High-Density Polyethylene) is made as bottles for milk, water, cosmetics, shampoo and liquid soap, and shopping or retail bags, and PP (Polypropylene) is made as ketchup bottles, margarine containers, medicine bottles, and medical tubing. In addition, Berger (2002) found that the potential of unused materials that can be reused across the country is about 16-34 percent of the total waste collected, but only 7% or approximately 2,360 tons per day are recycled and reused.

2.4.5.4 Best Practice for Energy Use from Recovered Waste

There are several ways of waste recovery depending on conditions and characteristics of the waste, which can be summarized into five main approaches. First is material recovery by reusing classifiable waste through a recycling or reusing process. Second is energy recovery by utilizing the waste that can be converted into thermal energy or biogas. Third is to use food waste left over from eating or cooking to feed the animals. Fourth is to convert the waste to benefit the soil, fermenting fresh or food waste as fertilizer. Fifth is to use the waste for area improvement by means of sanitary landfill in order to obtain an area for growing crops or establishing a parks or stadium (Graci & Dodds, 2008). Lewis and McCann (2004) noted that according to the waste regulations, the recovery refers to a waste recovery to complement the integrated waste management process or an energy recovery or a utilization of waste that can be converted into thermal energy or biogas for other applicastions or actions. The main benefit of waste recovery is to make the waste useful in one way or another by replacing the use of other necessary materials. Besides, Aagreh and Al-Ghzawi (2013) stated that the extraction of valuable substances is divided into three types.

First is the extraction of valuable substances, such as extracting solvents from wastewater (material recovery). Second is to extract silver from the film development solution. Third is to make fertilizer from waste (energy recovery) by extracting useful energy, such as fermenting the waste to obtain biogas that can be used in cooking and burning the waste to obtain heat for electricity generation. Vila, Enz, and Costa (2011) presented examples of waste recovery in the hotel business by pulling back organic substances for their reuse without using any of solvents, including composting, biological conversion process, and soil treatment that is beneficial to improving the agricultural areas or trees around the hotel or is beneficial to the ecosystem. According to previous studies, the hotel's waste recovery is involved with reusing the energy from organic waste especially from the kitchens and dining rooms, and composting or making fertilizers for treatment of crops. This waste recovery aims to fulfill or complement the waste management cycle.

2.5 Deming's Concept and Theory of Plan-Do-Check-Act (PDCA)

Previous studies used the waste management theory in hotels and it is obvious that Deming's Theory of PDCA (Plan-Do-Check-Act) Cycle has been acceptable and suitable for use in various managements of the hotels (Table 2.6). This study therefore uses this theory as its guideline. Deming (1982) opined that the establishment of a higher quality hotel means to reduce the costs and to increase the productivity. This gives the company a greater market share and increased competitiveness. This means that the cost reduction can help to gain more market share (Juran, 1988). Therefore, the higher quality waste management has a positive effect on the performance of the hotel business. The idea has been supported by many studies, such as Sila and Ebrahimpour (2005), Douglas and Judge (2001), and Lee, To, and Yu (2009). However, many previous studies applied Deming's Theory of Plan-Do-Check-Act (PDCA) Cycle. For example, Tsai, Hsu, Chen, Lin, and Chen (2010) conducted a study Enlitled an integrated approach for selecting corporate social responsibility programs and costs evaluation in the international tourist hotel. They applied Deming's Theory of Plan-Do-Check-Act (PDCA) Cycle and found that it is appropriate for the hotels to use a waste management process based on the PDCA

principle for social responsibility. Del Mar Alonso-Almeida and Rodriguez-Anton (2011) also studied the organizational behavior and strategies in the adoption of certified management systems: an analysis of the Spanish hotel industry and found that the PDCA cycle applied from the ISO 14001 environmental standard is accepted that it can create a good strategy to meet the increased needs of hotel customers in the present time. The higher quality of service must be based on the PDCA principle be change from an intangible to tangible service as shown in Table 2.6.

Table 2.6 Theory wheel Deming Plan-Do-Check-Action (PDCA) that had been used in Past Research

Authors/year	Title	Theory
Misra (2014)	TQM practices in hospitality and tourism sector in India	PDCA
Sun (2013)	A Study on the Continuous Improvement of Hotel Service Quality Based on the PDCA Cycle	PDCA
Pereira-Moliner, Claver-Cortes, Molina-Azorin and Joss Tari (2012)	Quality management, environmental management and firm performance: direct and mediating effects in the hotel industry	PDCA
del Mar Alonso-Almeida and Ro driguez-Anton (2011)	Organisational behaviour and strategies in the adoption of certified management systems: an analysis of the Spanish hotel industry	PDCA
Tsai, Hsu, Chen, Lin and Chen (2010)	An integrated approach for selecting corporate social responsibility programs and costs evaluation in the international tourist hotel.	PDCA
Kozak and Nield (2004)	The role of quality and eco-labelling systems in destination benchmarking.	PDCA
Kozak and Rimmington (1998)	Benchmarking: destination attractiveness and small hospitality business performance.	PDCA

2.5.1 Concept of General Management according to Deming's Theory of Plan-Do-Check-Act (PDCA) Cycle

Plan-Do-Check-Act (PDCA) Cycle was first discovered in 1947 by Dr. Shewhart, an American scientist, and then Dr. Deming publicized it in Japan until it was successful and improved for more efficiency in working performance. This cycle consists of two functions. First is a temporary action that is intended to fix a practical problem (Plan-Do), and second is to fix the problem permanently, including the monitoring, cause management, and sustainable improvement of goal (Check-Act) (Kozak & Rimmington, 1998). Tsai, Hsu, Chen, Lin, and Chen (2010) said that Deming's PDCA Cycle is a systematic process to work properly, efficiently and reliably. It consists of (1) Plan is to learn different processes or problems, of the identification of problems and planning for solving problems, such as learning of customer expectations towards the products and establishment of quality improvement targets and procedures to achieve them; (2) DO is to implement the plan determined in the first step and to measure the results occurred. In this step, all relevant people should be informed of the plans and practices as well as be allowed to take part in the implementation of plans established; (3) Check is also called the study because it is involved with an analysis of all plans established rather than a simple monitoring. This analysis aims to see if the implementation of these plans can achieve the targets determined, what problems happen, and how to solve them; and (4) Action is to implement the tested and revised plans to ensure the quality improvement after this step is completed and the implementation is evaluated. After that, it is the time to return to the first stage of the cycle in order to identify new problems and define new plans for solving these new problems. This practice can lead to a continuous improvement in the production of goods and services.

Thus, according to Deming's Theory of PDCA Cycle, the plans must be carefully established to ensure the gradual actions before checking the results obtained. The most effective practice is classified as a standard. If the goals established cannot be achieved, a new practice must be sought or more efforts must be made. The detailed actions are as follows:

2.5.1.1 Plan

Environmental policy drives the practices and improvement of the environmental management system of the organization in order to maintain and improve environmental performance as far as possible. Thus, this policy should reflect the commitment of senior management to comply with the laws and the continuous improvement. The policy determines the objectives and goals. It must therefore be clear enough to be understood by both inside and outside people who are interested as well as should be periodically reviewed and updated to reflect the changing conditions and information. The scope of the environmental policy should be clearly identified.

Regarding the implementation of the policy by the organization, Kozak and Nield (2004) said that it is necessary to establish a plan before actual actions by making aware of what to do, for what, and what problem to be solved. The details of various actions in the planning must determine the procedures and the executives must monitor and follow up the performance according to the plan established. The planning of actions is involved with determining the environmental aspects. Organization must have a process to identify major environmental aspects based on their priority. This process must take into account the expenses, analysis period, and reliable information and data prepared as well as the appropriate level of control in the practices associated with relevant service activities of the organization both in the present and past. Also, it must consider normal, emergency, and work stop and start conditions, including the major effects that may occur. Moreover, it must consider the legal and other requirements. Organization is required to prepare the requirements covering all of its activities. In addition, organization must set its objectives and targets. Objectives must be specific and targets must be measurable as far as possible. Finally, appropriate preventive measures must be taken into account by using good, but economical and cost-effective, technologies.

Planning the environmental management program regards the program as a significant component leading to the successful performance of the environmental management system.

2.5.1.2 Do

As for the operations as planned, Sun (2013) mentioned that it is necessary to focus on various parts, including people, systems, resources and operational structure. In order to be effective, there must be structure and responsibilities. The success of the environmental management system relies on the commitment of the personnel in the organization and on the environmental responsibility. The commitment must start from the organization's top management who determines their environmental policy as well as the organization must ensure that such environmental management system is actively implemented. The senior management therefore appoints their management representative (EMR: Environmental Management System) with the authority and responsibility for implementing the environmental management system of the organization. Senior management must take care to provide appropriate resources in order to maintain and retain the compliance. Another important thing is the clear establishment of major responsibilities in the system that must be communicated to personnel involved. In addition, there must be training, awareness and competence. Organization must also provide training to all personnel with regard to the knowledge of the environmental management system, and the procedures must be prepared and followed. Moreover, organization must have the communication to ensure all employees know and understand its environmental policy and environmental management system, including publicizing them to the outside. Furthermore, there must be an action plan to receive responses, information and complaints from those caring for the environment, including operation control. Organization must indicate the processes and activities associated with the environmental aspects that are analyzed and correlated with its policies, objectives and targets. Finally, organization must have emergency preparedness and response as well as determine how to prepare and respond to the situations, accidents and emergency events in order to prevent and mitigate the environmental impacts that may follow.

2.5.1.3 Check

Regarding the practices to ensure a good implementation of various requirements in the environmental management system and of other relevant activities, Rondinelli and Vastag (2000) stated that these practices should be taken

and corrected based on the monitoring and measurement. Organization must determine a written procedure of a continuous monitoring and measurement for processes and activities that may significantly affect the environment. The monitoring instruments must indicate nonconformance and corrective and preventive actions. Moreover, organization must establish and maintain the procedure for determining a cause and correcting the nonconformance as well as have a record. Organization must also have the procedure for the identification, storage and destruction of data, including the recording of performance significance and environmental management system audit. Finally, organization must have the audit schedule and procedures covering all activities involved. This audit may be done by people inside or outside the organization. Selection of auditors should be those who conduct the audit fairly and systematically.

2.5.1.4 Action

As for the management review, Neumayer and Perkins (2005) said that this management review should be kept to maintain the effectiveness of an environmental management system and continuous improvement, which is the most important requirement. Organization's management should review and evaluate the performance as scheduled as well as improve the policies or programs to fit the facts or problems of organization in order to improve its performance and to prevent or fix the problems or defects that prevent the targets from being achieved as desired. This four-step process is an endless process like the spinning of a wheel and this PDCA cycle serves as a cycle of improvement as shown in Figure 2.3.

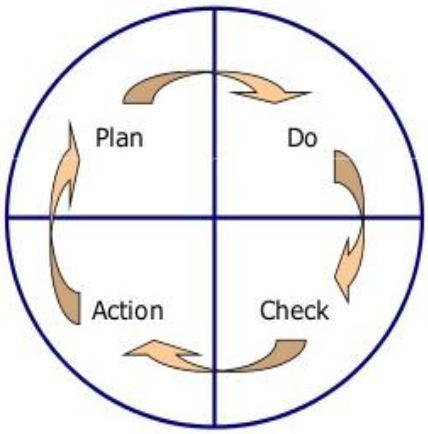

Figure 2.3 Deming Wheel PDCA (Plan-Do-Check-Act Cycle)
Source: Deming, 1982.

However, the application of Deming's Theory of PDCA (Plan-Do-Check-Act) Cycle in this study is still not enough because under the environmental management standards for services establishments there is also the ISO 14001 environmental management standard system that the hotels must be adhered to. This ISO 14001 environmental management standard system can be regards as a management system with standardized and clear requirements in the system itself. Nevertheless, the operations according to such standard to achieve the desired targets also depend on other areas of administrative knowledge. In addition, this standard focuses on managing the whole system ranging from the production process to the end as well as is also involved with the use of such products as to where and how to discard and dispose of them after they are expired. This depends on a comprehensive management plan throughout the lifetime of each product and emphasizes on the reuse rather than becoming the waste. This suggests that both Deming's Theory of PDCA (Plan-Do-Check-Act) Cycle and the ISO 14001 environmental management standard system are related to each other, which is appropriate for the waste management of hotels.

2.5.2 Application of Deming's Theory of PDCA (Plan-Do-Check-Act) Cycle to Environmental Management Principles According to ISO 14001 Environmental Standard

Deming's Theory of Plan-Do-Check-Action (PDCA) Cycle was applied with the environmental management according to the ISO 14001 environmental standard and developed as the principle of standard audit of the environmental management systems in different countries. This has forced companies to follow in order to ensure their operations do not have any environmental impact. Heras-Saizarbitoria, Arana, and Molina-Azorin (2011) explained that the ISO 14001 standard is involved with the international environmental management set by the International Organization for Standardization located in Geneva, Switzerland. It serves as an international standard regarding the environmental quality in the productions and standards of products. It also covers employee training and responsibility management for different environmental systems within the organization (Chan & Wong, 2006).

The principle of ISO 14001 is based on the continuous improvement starting from the establishment and implementation of the management system and environmental policy, the monitoring of the effectiveness of the system and correction of defects, the periodical consideration and review of the appropriateness of the system by executives, and the re-establishment of new targets to initiate a new cycle of the system. This environmental management system has an interlocking mechanism, but it must be further expanded and adapted to suit the environment as well. Chan and Wong (2006) added that whether the system is successful or not depends on the people and resources to be used in the system. This process consists of many steps. First is to identify the environmental aspects caused by the company's operations, products or services. Second is to prioritize the aspects and to completely comply with laws or regulations relating to the environment. Third is to define the objectives and goals of the environmental improvement by covering environmental aspects that are of utmost importance as prioritized as well as to take into account the views of interested parties, such as communities, government, NGOs and other stakeholders. Fourth is to prepare an action plan for environmental management to be taken in the organization by ensuring they meet the objectives and targets under the principle of the ISO 14001 standard. The improvement of the environmental

management system and environmental performance must be continuous (Boiral & Sala, 1998; Chan & Wong, 2006). Stenzel (2000) supported that after a period of planning for the ISO 14001 environmental standard, the next step is to meet the requirements of the ISO 14001 environmental standard. This means that it is necessary to make it clear to everyone on what role and duty they have as well as to have a representative of the environmental management section to coordinate with the top management. Moreover, there must be training, communication channels both inside and outside the organization, and documentation of what has already been done. Once the management system according to the ISO 14001 environmental standard is implemented, the monitoring and continuous improvement must follow.

However, Roy, Boiral, and Lagace (2001) stated that environmental aspects are concerned by the entrepreneurs of service businesses. It is highly likely that these entrepreneurs need to develop environmental programs by implementing the ISO 14000 standard as a way to build their better relationships with customers and communities. Some organizations believe that the certification of this ISO 14000 standard helps create an environmentally friendly hotel, which is a method to differentiate them from their rivals in terms of competitiveness. Poksinska, Jorn Dahlgaard, and Eklund (2003) said that hotels following the ISO 14000 environmental standard successfully will encourage other hotels to use this principle. Rondinelli and Vastag (2000) reported that the compliance with ISO 14001 allows the hotel employees and managers to be more aware of the environmental impacts, including having a good effect towards the communities nearby. Neumayer and Perkins (2005) cited that there are two motivations behind the hotel's compliance with the standard. First are the effectiveness of the environmental management and an increase of hotel's productivity or profitability. This means that the number of customers interested in staying the environmentally friendly hotels is more. Second is the social pressure or laws that persuade the hotel executives to implement such environmental standard.

The ISO 14001 standard or the environmental management system is used as a guide for organizations or departments to organize their management system to achieve their environmental policy defined. Thus, the environmental management system is a system with a clear structure of duties and responsibilities. In addition,

there are adequate processes and resources to implement the system under the following criteria: Planning, Doing, Checking, and Action.

2.6 Conceptual Framework Proposal of the Research

According to the literature review, a conceptual framework for this research is developed as shown in Figure 2.4. This conceptual framework for the zero waste management of small hotels proposes two steps. First is to study eight factors that contribute to the waste management of small hotels, including hotel's location, waste management method, finance, regulation, executive, employee and customer. These factors must be taken into account before the next step in waste management. Second is to establish the waste management of the hotels applied from previous studies and Deming's Theory of PDCA Cycle. The first step is to define a policy for waste management of the hotel (Plan). The next step is to integrate the waste management procedures from previous studies according to the 3Rs (Reduce, Reuse, Recycle) principle and 1R (Recovery) into practice in a good waste management (Do). The third step is involved with the measurement by relevant individuals to find out the shortcomings in such action (Check). The final step is to analyze the plan to see how much the targets are achieved as defined and the plan will be improved to be satisfied before returning to the first step as detailed in Figure 2.5.

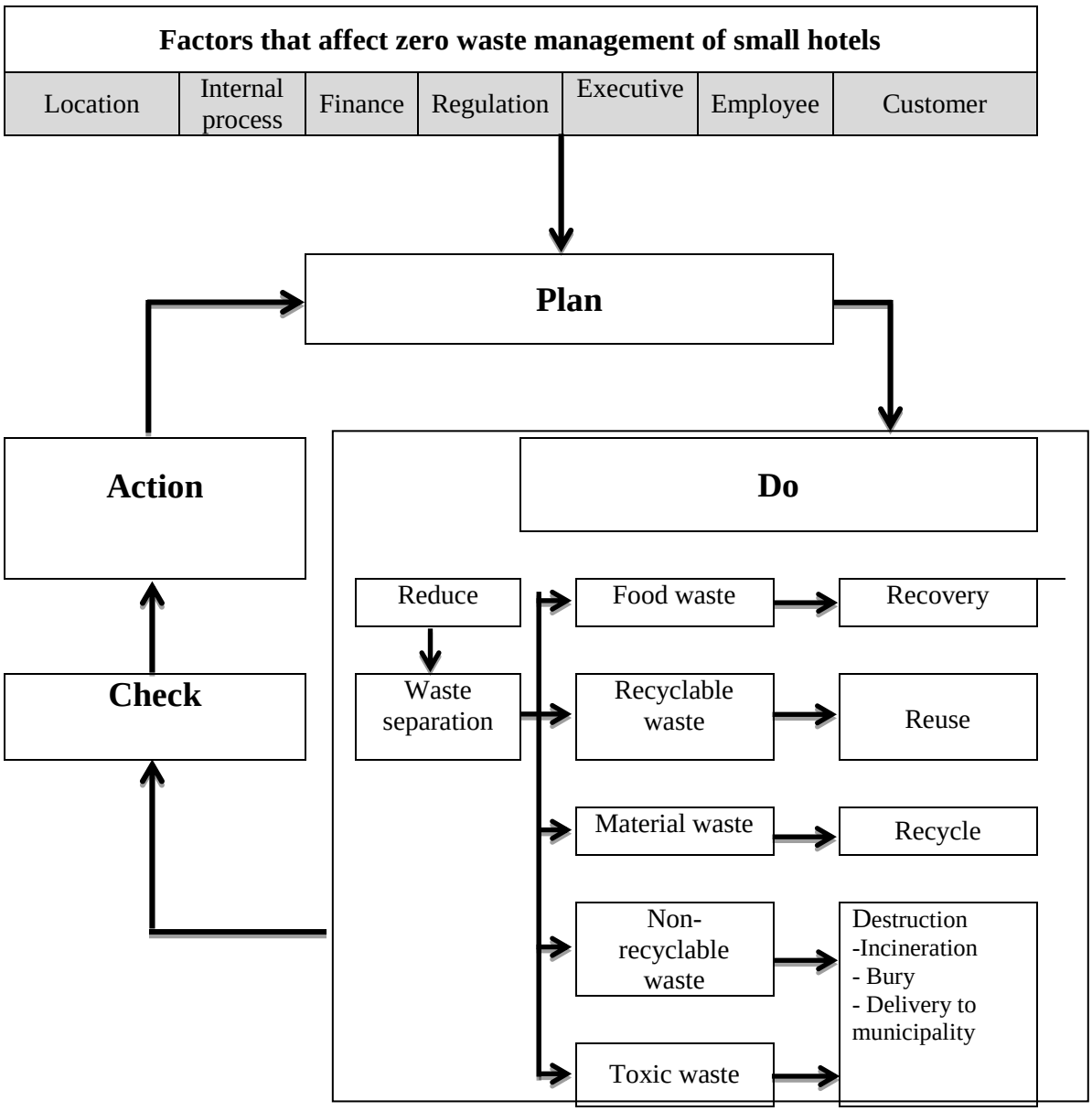

Figure 2.4 Conceptual Framework Proposal of the Research, Zero Waste Management of Small Hotels

2.7 Summary

This chapter reviews the literature starting from the history and meaning of a small hotel that is defined as a hotel with the limited number of rooms and employees, services that are better accessible to customers than a large hotel, and uniqueness. In addition, it provides the meaning and importance of zero waste management as a popular and good way of waste management. Factors that affect the successful waste management of hotels are also discussed. There are eight factors involved, including employee cooperation, best practice of waste management, agreement of hotel's executive, waste management cost, regulations, hotel's location, customer cooperation, and season. They are then used to establish a zero waste management policy to lead to the practical process in waste management with the appropriate steps for small hotels. The waste in hotels is classified into five categories, i.e. food waste, recyclable waste, non- recyclable waste, material waste, and toxic waste. There is additional knowledge by changing from the principle of 3Rs to 4Rs (Reduce, Reuse, Recycle, and Recovery), which aims to reduce the amount of waste in the zero waste management process. In addition, Deming's Theory of Plan Do Check Action (PDCA) Cycle is integrated with the ISO 14001 environmental standard as a practical guide to lead to the final conceptual framework for this research. Conceptual framework can be developed as a framework to reduce the amount of waste generated in the hotels, which is the target of this study. The next chapter will describe the research methodology and the importance of principle and strategy development as well as discuss the data collection, analysis techniques, and discussions of results.

CHAPTER 3

RRESEARCH METHODOLOGY

3.1 Introduction

The purpose of Chapter 3 is to study the methodology of the study based on research questions established and contains eight section. The first section is the introduction that describes the process details and provides illustrations for more clarity in Figure 3.1. Section 3.2 explains data collection and procedure to obtain the sample. This study uses two groups of sample: in-depth interviews and group discussions. Section 3.3 describes two research tools, including a semi-structured interview form designed to identify the factors that promote waste management and waste management best practice and a structured discussion form designed to test the effectiveness of the zero waste management model of small hotels. Section 3.4 tests the interview form before its actual application. Section 3.5 analyzes the acquired data to determine the meaning of the data collected and to find common statements to tell the relationship of things, which aims to establish a concept or theory based on the fundamental data that consists of data storage, indication, summary, interpretation and validity. Section 3.6 describes both internal and external data inspections and Section 3.7 describes research ethics. Finally, Section 3.8 summaries Chapter 3. All of which are shown in Figure 3.1.

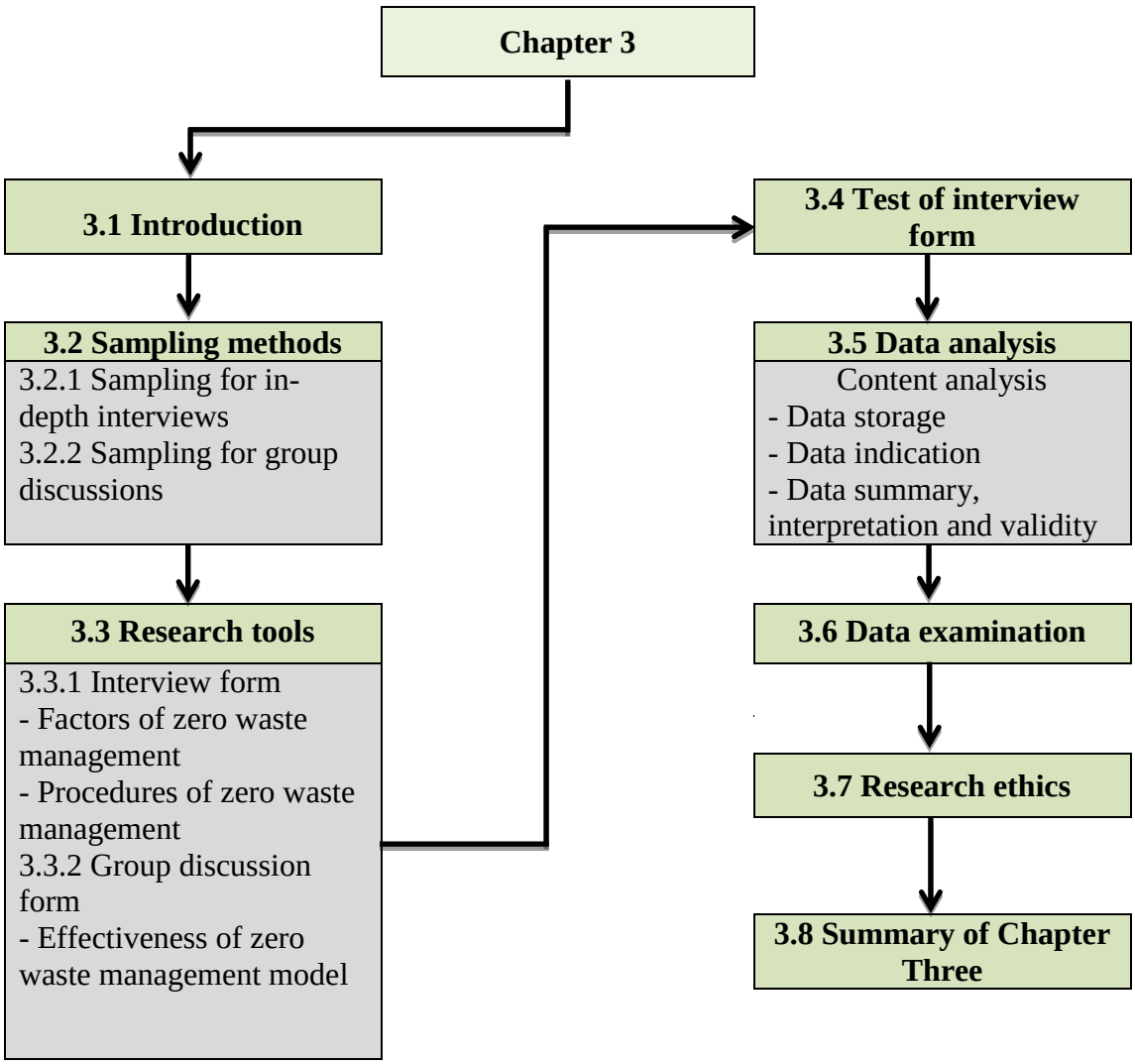

Figure 3.1 Chapter Three Structure

This study uses a qualitative approach technique for many reasons. For example, the phenomenon of the zero waste management of small hotels is complex so the researcher cannot examine each part, case or event, which is related to each other, separately, as well a question the study on the factors cannot be easily converted into numbers; however, even such conversion is possible, it may not point out the importance of the whole system as good as it should if a quantitative research technique is used. Bacot, McCoy, and Plagman-Galvin (2002) support that a qualitative research gathers multiple dimensions of data regarding the phenomenon studied in order to obtain the overall pattern with a complete understanding on all sides; while Lincoln and Guba (1985) and Patton (1990) state that a qualitative

research focuses on the holistic education because there are several facts. Therefore, the qualitative research will help to better understand the experiences, feelings and opinions of the people based on an in-depth interview. In addition, previous studies in regard to waste management used a qualitative research as a tool to find out their answers as shown in Table 3.1.

Table 3.1 Use of Qualitative Research in Hotel's Waste Management

Author(s)/ Year	Study Area				Methodology	
	Reduce	Reuse	Recycle	Recovery	Quantitative	Qualitative
Nakasima, Kojima and Gupta (2012)	✓	✓	✓		✓	
Radwan, Jones and Minoli (2012)		✓	✓			✓
Radwan, Jones, and Minoli (2010)		✓	✓			✓
Abu-Taleb, Alawneh and Smadi (2007)	✓	✓	✓		✓	✓
Bohdanowicz (2005)	✓	✓	✓		✓	✓
Baker and Vandepeer (2004)	✓	✓	✓	✓		✓
Bacot and Plagman (2002)	✓	✓		✓	✓	✓
Seigneur (2000)	✓	✓	✓			✓
Cummings (1997)	✓	✓	✓			✓
Hallberg (1989)	✓	✓	✓	✓		✓

3.2 Data Collection

Qualitative research aims to achieve the goals established regarding the zero waste management of small hotels and uses a data analysis based on descriptive explanations of the documents and information from field research. It consists of establishment of objectives, data collection, analysis and interpretation, and improvement of plans. It selects two sample groups providing data in the in-depth interviews and group discussions from hotel owners, managers and those involved in waste management as detailed below.

3.2.1 Population for this Study

The population of the research and the sample are not the same thing. "Population" means the population whose qualification meets those used in the study and defined by the researcher, which may be several and widely distributed, while "sample" refers to part of the population to be studied, which is representative of the whole population. The sample can serve as a good and reliable representative of the population if the sample selection and size are appropriate (Creswell, 2013). This study selects both population and sample based on the information obtained from the field research in order to explore the basic, but less, knowledge and understanding of the zero waste management. It has no predefined conceptual framework and aims to understand the issues, meanings and experiences of the individuals or groups of individuals in their real situations or in each problem of zero waste management of hotels.

Population in this study includes people who own the hotel business with no more than 50 rooms consisting of 201 hotels located on Koh Samui and 106 hotels located on Koh Pha Ngan with a total of 307 hotels (Department of Provincial Administration, 2014) in Surat Thani because these areas are tourist attractions that are top-ranked world famous among both Thai and foreign tourists who have come to these locations resulting in an accumulated waste problem inevitably.

3.2.2 Data Collection Process

The "purposeful sampling" is conducted for entrepreneurs of small hotels with no more than 50 rooms consisting of 201 hotels located on Koh Samui and 106 hotels located on Koh Pha Ngan with a total of 307 hotels (Department of Provincial Administration, 2014) in Surat Thani so that they can solely provide their critics appropriate to the subject studied one-by-one. Once the interview is complete, the next interviewee is then interviewed until obtaining duplicate data.

The sampling technique used in this study is snowball sampling (Bogdam and Tayloe, 1975). It starts from selecting the specific sample of the population that is consistent to the issue to be studied, i.e. zero waste management of small hotels. The criterion set up by the researcher includes small hotel owners/managers or those involved with the hotel's waste management who have knowledge/experience in waste management, and more importantly, they must be willing to cooperate to provide their information. The researcher selects from the first hotel to discuss until having enough information and then asks these interviewees to suggest next hotels until data saturation. This procedure relies on the grand theory by creating information with enough depth to make it clearer in terms of categories, properties and dimensions of the phenomenon studied (Corbin & Strauss, 2015). In order to acquire data with such depth, it is required to have a sample with sufficient size to cause enough information for theoretical saturation with no new information. If there are duplicate data, the process must be re-considered in order to compare and check the pattern and concept. Once sufficiently understanding about the pattern and concept of data in various dimensions, next interviews are done until data saturation (Strauss & Corbin, 1994).

The period of data collection is from May to October 2015 because during that period there are fewer tourists so hotel owners/managers have more time and convenience for giving their information. However, during this period there are some tourists staying in these hotels so the researcher can see the process that produces waste in small hotels. The interview took 45 minutes to 1 hour per person.

3.2.3 Participant for Group Discussions

Defining a target participant for group discussions is based on the appropriateness to the research title and topic "Pattern of Zero Waste Management of Small Hotels: A Case Study of Southern Region in the Gulf of Thailand" by focusing on the interaction of group members to share their experiences and debates in the form of challenging questions and disagreements. This interaction leads to the reviewing and understanding dimensions. A group discussion takes about 2-3 hours depending on whether there are many or less opinions from group members to share each other (Kham & Manderson, 1992). Selection of members for group discussions is based on the purposeful participant method and on the appropriateness with the issues according to the third research question in order to determine the effectiveness of the zero waste management model of small hotels and to therefore confirm its actual application as well as to provide everyone attending the group discussions the ease of interaction to each other. The researcher selects the members with similar qualifications in terms of their knowledge and experience in hotel's waste management and with familiarity so that they can express themselves to have a free conversation (Barbour & Schostak, 2005).

Selection of members for group discussions based on purposeful participant technique as mentioned above is composed of one academician with hotel knowledge and experience, one academician with environmental knowledge and experience, one Koh Samui Municipality officer, one Koh Pha Ngan Municipality officer, and one hotel owner/manager who gave interviews in the first and second research questions from each hotel, a total of three hotels. There are seven people joining these group discussions and the researcher conducts the meeting by encouraging these members of the meeting discuss the topics with enthusiasm and controlling the discussions in the right direction as well as collecting enough important information.

3.3 Research Instruments

A qualitative research is an in-depth, rather than breadth, study because it aims to obtain in- depth knowledge and it is necessary for researchers to have multiple data types and enough details on the issues studied. However, almost all qualitative

research tools available have one important feature in which they are unstructured. This means that the researchers can adjust such tools to suit the data resources and situations as long as the important principles and techniques are intact. Thus, the researchers themselves are very important. Effectiveness of these data collection tools more depends on their users than tools themselves. There are two tools created for this research as follows:

3.3.1 Semi-structured Interview Question

The semi-structured interview Question starts by allowing the interviewees to share their experience and knowledge available to help guide the development of the hotels followed by the content of waste management according to the research questions (Chesebro & Borisoff, 2007). This semi-structured interview form is built on the theory of Deming's Wheel: Plan Do Check Act (PDCA). Plan refers to the hotel policy on the zero waste management, Do refers to the practices in the zero waste management, Check refers to the monitoring of the zero waste management, and Act refers to the management's performance regarding the zero waste management of their hotels.

Part 1: Factors in Zero Waste Management

Waste management in small hotels encounters several problems and each problem must be properly addressed based on the factors that contribute the solutions for these problems. This study creates a semi-structured interview form to use with the owners/managers of small hotels with regard to the factors to be used to help solve the zero waste management in the hotels in order to guide the development of pattern in the zero waste management of small hotels. The researcher examines previous studies and there are eight factors that help solve waste management problems: Physical, Technical, Financial, Reciprocal Enforcement of Hotel, Hotel and Managerial, Employee, Customer, and Season factors, respectively. These factors are used to guide the interviews based on the following questions:

1) How does the geographic condition of the hotel influence waste management?

2) What is the method that can help waste management?

3) How does the budget for waste management contribute to waste management?

4) What are the hotel regulations that contribute to waste management?

5) How do the hotel owner/management contribute to waste management?

6) How does the employee cooperation contribute to waste management?

7) How do the customers contribute to waste management?

8) How does the season affect waste management?

Part 2: Procedures in zero waste management (PDCA)

The second part of the semi-structured interview aims to know the process of the zero waste management of small hotels. This study uses and adjusts the theory of Deming's Wheel: Plan Do Check Act (PDCA) as appropriate to the research areas. Research questions are created by the following four big steps:

Plan: How does the hotel plan for its zero waste management? This consists of two parts: objectives and goals and action plans (Neumayer & Perkins, 2005).

Item 2: What is the hotel policy regarding its zero waste management planning?

1) What are the action plans?

2) What are the objectives and goals?

Do: Best practice to prevent and reduce the generation of waste of small hotels is built into the following five interview questions:

Item 3.1: How does the hotel prevent the generation of waste (Reduce)?

Item 3.2: What are the types of waste generated in the hotel?

1) Food waste

2) Reusable waste

3) Non-reusable waste

4) Toxic waste

5) Material waste

Prevention means that the hotel repairs things until they are usable and avoids using what may generate waste. It also means the processing and recycling by means of waste separation in order to reduce the amount of waste that must be really disposed of as minimum as possible.

Utilization of waste means to process the packaging waste or unused materials into raw materials in the manufacturing process or for their conversion.

Item 3.3: How does the hotel reuse its waste?

Item 3.4: How does the hotel recycle its waste?

Item 3.5: How does the hotel recover its waste?

Check: It is a process of hotel owners/managers to monitor/control and evaluate the performance as well as determine the improvement measures. Question used in the interview is as follows:

Item 4: How does the hotel monitor/control its waste management performance?

Act: This refers to the actions of hotel owners/managers in terms of their previous performance by comparing in to the policies based on financial, customer, process management, learning and environmental perspectives with a continuous improvement of performance. Question used in the interview is as follows:

Item 5: How does the hotel improve its performance?

3.3.2 Group Discussion

The second tool is a group discussion form designed to find out the answer of the third research question in order to determine the effectiveness of the zero waste management model of small hotels. This group discussion presents appropriate problems, topics, questions and objectives of the research developed from Stewart and Shamdasani (1990) in regard to the efficiency of the model. However, this study generates questions stemming from the answers of the first and second research questions. In addition, this evaluation form uses the principle of Balanced Scorecard (BSC) as a tool in the evaluation based on the following five perspectives: financial, customer, internal process, learning and development, and environmental perspectives.

Creating the guidelines of questions for discussion meets the determination of the moderator as well as meets the research topics and questions. Also, it is consistent with the characteristics of the sample. These questions are structured and open-ended, including other relevant questions. Questions of discussions comprise six issues: factors that contribute the zero waste management of small hotels, policy on zero waste management of small hotels, operations of zero waste management of small

hotels, monitoring of operations of zero waste management of small hotels, owner's/ manager's performance of zero waste management of small hotels, and effects of hotel business operations on the use of zero waste management model based on the principle of Balanced Scorecard (BSC). Questions used in these group discussions are as follows:

Item 1: What are the factors that influence the waste management?

Item 2: What is the hotel's waste management policy?

Item 3: What is the hotel's waste management process?

Item 4: How does the hotel monitor the correctness of its waste management?

Item 5: How does the hotel management conduct its waste management?

Item 6: How does the hotel conduct its zero waste management in terms of financial perspective?

Item 7: How does the hotel conduct its zero waste management in terms of customer perspective?

Item 8: How does the hotel conduct its zero waste management in terms of internal process perspective?

Item 9: How does the hotel conduct its zero waste management in terms of learning perspective?

Item 10: How does the hotel conduct its zero waste management in terms of environmental perspective?

3.4 Validity of Interview

Content validity of the interview Process is based on the Index of Item Congruence (IC) or CVR (Colton & Covert 2007, pp. 75-77) by using four owners of small hotels located in the research areas, including Pha Ngan Bay Resort, Baan Panburi Resort, Long Beach Lodge, and Home Bay Resort. The researcher checks the statements from the interview form to see if the contents in different areas specified can be measured. Calculation of IC of the content validity uses the following formula:

$$IC = \frac{\Sigma R}{N}$$

IC = Index of Item Congruence
ΣR = Summary of opinion scores from experts
N = Number of experts

IC obtained must be ≥0.50. If it is less than 0.50, it must be improved.

3.5 Data Analysis for this Study

Data analysis is the process of organizing the structure to find out the meaning of the data collected from general texts that describe the relationship of things. It establishes a new concept or theory based on the explanation from fundamental information (Marshall & Rossman, 1995). This study uses the content analysis technique to analyze the data by three reasons as explained by Bemard (1994). Firstly, data organizing is a management process with various solutions to make the data orderly, both in terms of its physical and content aspects, and ready to be presented in a systematic way. Secondly, data display is a process of data presentation because most data obtained are in the form of description as a result of linking organized data together according to the conceptual framework used in the analysis to tell the story. Finally, conclusion, interpretation and verification are a process of determining the conclusion and interpretation of the results or findings obtained from data display together with the verification whether such conclusion/interpretation are accurate, relevant and reliable. This conclusion and interpretation are probably in the form of an explanation, conceptual framework or theory about the matter analyzed, and these three elements proceed simultaneously with the following details:

3.5.1 Data Organizing

Data organizing in this research aims to organize the data in a state that is ready to be conveniently analyzed. The researcher organizes the data in terms of physical and content aspects, which starts from data collection.

There are many things the researcher must do and most of which occur when the researcher is still performing the field data collection, including the transcription of the data recording for safety and convenience for searching or browsing for later use.

Transcription of sound recorder, both interviews and group discussions, is done on a verbatim basis by maintaining a natural emotion and atmosphere of the conversation because they may tell something in what they are saying. The "verbatim" transcription may need a language refinement to have more graceful statements because the interviewees use their southern language. The main principle of this data refinement is to still maintain the original meaning and emotional content of speakers as much as possible.

Data storage is part of physical data organizing that is directly related to the security and browsing of data for later analysis. The researcher collects the data based on a criterion of separating the interview data from group discussion data and each section is also sub-separated, such as interview data of factors contributing waste management and of waste management process. The researcher relies on a good and easy-to-find system. Another important point for data storage is the confidentiality of all data collected that are deemed a secret of information providers and the researcher is always aware that the researcher is allowed to collect their data because the interviewees are informed before data collection that their data will be gathered for research purposes only without any disclosure to those not involved in the research.

3.5.2 Content Analysis

This is a process of searching for the meaning of the texts in the data in order to facilitate the classification of data based on the meaning appearing in such texts because all data collected from the field and physically organized are mixed and cannot tell anything specific. In addition, this process includes data reduction by sorting out and replacing the messages scattered and those with the relevant meanings

with a coding. Data analysis process of organizing the structure and meaning of the information we gather to describe the relationship. Concept creation Create a theory that describes the data from the foundations (Patton, 1990). The procedure is as follows:

Data coding is an important part of the data analysis process. The researcher reads the physically organized data thoroughly to find out the texts relevant to the subjects requiring the analysis. When finding out the texts relevant to the points as desired, a coding will be defined to represent such texts by defining it first in the step of establishing the question guidelines for interview. Not all data are coded, but this coding is done only for data with a meaning that can be linked to important issues or matters that directly affects the answers of research questions. The messages with the same meaning will be coded with the same code, whether they are short or long and whether there are speech or text (Kvale, 1996; Patton, 1990).

Data reading for coding: By reading the data, in addition to looking for the messages that will be helpful in the coding, the researcher is also interested in the content, quality and structure of the data (Ulin, Robinson, Tolley, & McNeil, 2002). Also, the research considers whether all data have enough details in each area planned. During reading, the research notes any new issues that should conduct an additional data collection. This is useful for data improvement and storage. Moreover, during reading, the research considers whether the quality of these data is enough. The researcher performs data collection by strictly complying with methodology by providing topic discussions among participants. Comparative contextual data are also recorded by the researcher.

Regarding the data structure, when finding out important topics that may be used as a guideline for analysis, these topics are examined whether they are related to each other and in what way, such as they are favorable or contrary to each other. This structure may be involved with some or all data or topics in order to lead to the answers of the research questions.

Name and definition of code indicate the meaning required by the researcher and at the same time allow the researcher to find a message that tells such meaning in the data with a code generated as well as to define its clear meaning. Regarding the coding, the researcher uses self-ability to read the meaning of such message

thoroughly to consider what messages come with a meaning relevant to the subject of analysis and then to code it. After that, the researcher asks peers to examine and provide additional opinions in order to add the reliability of the code and to properly monitor the analysis before displaying such data and determining the conclusion.

3.5.3 Data Display

Data display is the process where the researcher selects and combines the data broken up into smaller units during coding together to obtain another level or meaning and understanding. This step does not bring everything back into its original place, but it aims to group or classify them based on the relevant meanings of such messages resulting in a new meaning to help answer the research questions. The categorization of data uses the analysis theme defined as a guide, i.e. sub-topics in question guidelines. The research considers each code tells its meaning that should be included under what issue/topic. Then, the data corresponding to each code are chosen and taken into the same place for ease of reading in order to find out the meaning and summarize. Cut-and-past technique is to neatly bring together the texts with the same code that may spread in several places in all data and the source of every message is known. When this step is completed, the researcher obtains the data sorted out into different topics or issues specified making it easy to analyze. The next stage is data presentation with a lecture by linking various issues together based on their relevance and these data are then presented on what lead to answer the research questions established.

3.5.4 Verification, Interpretation and Conclusion of Research Findings

Data that are systematically coded and well displayed can earnestly tell the story of what and how it is. However, prior to the presentation of research findings, the researcher conducts the conclusion, interpretation and verification whether such conclusion and interpretation are correct or valid (Krueger, 1998; LeCompte & Schensul, 1999).

In determining the conclusion as a concept or theory, the researcher presents the data in the form suggested by Huberman and Miles (1994). Firstly, it aims to find out the noting patterns and themes, to know more about the data analyzed based on

relevant pieces of data, and to look for the data plausibility by attempting to answer the questions and finding out what the data tell and what seems to be the best conclusion of such data. Secondly, it aims to cluster the things with similar features into the same group and to make metaphors in order to see a clear picture of what is being analyzed. The words that cannot be understood or that are not clear, such as mentioning the food waste from the hotel's kitchen as "pig rice", are abbreviations or conclusions of such matters. The researcher looks for metaphors of information providers first in order to understand the meaning of truth and then fabricates the words that are easy to understand and reflect the views of such individuals. In addition, the researcher makes a contrast/comparison of what is being analyzed as well as thinks carefully first before comparing things in terms of their similarity/ difference. Moreover, similar matters are grouped under the same meaning and many similar or compatible points appearing in the analysis are grouped or classified into the same concept or idea. Evidences are reasonably linked to each other and the data are concluded based on these evidences, whether they are objects, behaviors or ideas, in the same way in order to explain the conclusion. Furthermore, a conceptual and theoretical conclusion that is consistent with the facts is made. All concepts obtained from evidences or findings are in line with reality.

3.6 Check the Reliability of the Data Analysis

This study is based on the data check the reliability of the data analysis suggested by Creswell (1998) consisting of internal and external examinations with the following steps:

Part of internal check the reliability of the data analysis is to examine the sources of data in terms of different times, places and interviewees to determine if data collection at different times, places and interviewees results in different data. Then, the data are checked for their reliability and the interviewer or researcher builds a good relationship to the interviewees in order to trust in the researcher, which can affect the accuracy and reality of data. The researcher then confirms the accuracy of the data by bringing the data obtained from the interviews that are carefully and clearly noted and explained back to the interviewees who in turn confirm the accuracy

of the data according to the reality and their feeling. In addition, the data validity is done by bringing the conclusion into the group discussions where scholars/owners/ managers of small hotels and hotel staff involved with waste management who gave the interviews determine the truth of data in order to obtain the best final conclusion and findings based on real data suitable for real applications (analysis of effectiveness of waste management model of small hotels). Also, the dependability of data is verified by the primary advisor of the dissertation to confirm the validity according to the research questions studied.

External check the reliability of the data analysis aims to check the reliability of data analysis from the outside by means of peer review and by presenting the research papers in academic conferences that are officially criticized.

3.7 Research Ethics

Code of conduct and ethics the researcher must always take into account all the time when making a research are to provide sufficient data to the sample that they ark for cooperation in data collection by using a clearly understandable language. In this study, the researcher asks the information providers to tell about waste management in the hotel they manage and this data provision will not affect them at all. The information provision must come with a voluntary cooperation and the data providers are entitled to refuse to answer any question or even to withdraw from the cooperation with no effect upon them later by any way.

More importantly, the researcher adheres to all guidelines set out in the National Institute of Development Administration (NIDA) and the data provided to the researcher by these data providers will be protected as confidential and undisclosed. The names of both participants and researchers are undisclosed that could allow the third parties can utilize in a way that will cause damage to these participants.

3.8 Summary

This chapter discusses the methodology of qualitative research used in this study in order to answer the research questions. An in-depth interview is a conversation using a semi-structured interview form (conversation) consisting of two parts. First describes the factors in the zero waste management that include seven sub-questions. Second details the process of the zero waste management (PDCA) consisting of eight sub-questions and five questions in group discussions. The population and sample are hotel owners/managers/those involved with waste management of 201 and 106 small hotels located on Koh Samui and Koh Pha Ngan, respectively, a total of 307 hotels (Department of ProvincialAdministration, 2014) in Surat Thani, Thailand.

In this study, group discussions occur after the complete creation of the waste management model in order to determine the effectiveness of such model. The process of these group discussions includes (1) defining appropriate problems or topics, including research questions and objectives, (2) defining the target population of the research, (3) establishing the question guidelines for conversation, (4) implementing the group discussions, and (5) managing and analyzing the data.

Content Analysis contains three main elements. Firstly, data organizing is a management process by different solutions to make the data in order. Secondly, data display is a process of data presentation in the form of description. Finally, data conclusion, interpretation and verification are a process to determine the conclusion and interpretation of the meaning of results or findings. This is summarized in Figure 3.5

The next chapter 4 will discuss the research findings and data analysis in this study

Table 3.2 Methodology of Zero Waste Management of Small Hotels

Research question	Methodology	Population	Sample	Sampling method	Tool	Data analysis
1. What are the factors in zero waste management of small hotels?	Quantitative research	Owners/managers/those involved in waste management of small hotels	Owners/managers/ those involved in waste management of small hotels	Snowball sampling	Semi-structured interview	Content analysis
2. What is the best practice in zero waste management?		Owners/managers/those involved in waste management of small hotels/academics	Owners/managers/ those involved in waste management of small hotels/academics	Purposeful sampling	Group discussion	
3. What is the effectiveness of in zero waste management of small hotels?						

CHAPTER 4

RESEARCH FINDINGS

4.1 Introduction

This chapter Re-instate the main research question of this study is what a good form of waste management in small hotels is by focusing on the factors and processes in waste management in Chapter 1. It includes the qualitative research results obtained from Face to face with hotel owners/managers and staff involved with waste management. This study used Koh Pha Ngan and Koh Samui, Surat Thani, Thailand, as its research area and collected the data at 34 hotels for a period of six months from May to October 2014. Two types of research instruments were used, i.e. semi-structured interview and group discussion. Semi-structured interview was developed to search for answers to the first research question (what are the factors in zero waste management of small hotels?) and the second research question (what is the best practice of zero waste management of small hotels?), while the third research question (what is the effectiveness of zero waste management model of small hotels?) was answered by group discussion.

This chapter has a total of four parts: 4.1 presents the overall results and data analysis of the research; 4.2 presents the test results of interview form to build its reliability before actual interview; 4.3 presents the results of this study consisting of three sub-sections: 4.3.1 factors in zero waste management of small hotels, 4.3.2 process of zero waste management of small hotels by presenting the details of planning, operation, inspection and action of management according to Deming's Theory of Do-Check-Action (PDCA) Cycle, and 4.3.3 effectiveness of zero waste management model of small hotels by presenting the results of group discussions to determine the model's effectiveness; and finally 4.4 summarizes all results of Chapter 4, which is detailed in Figure 4.1 below.

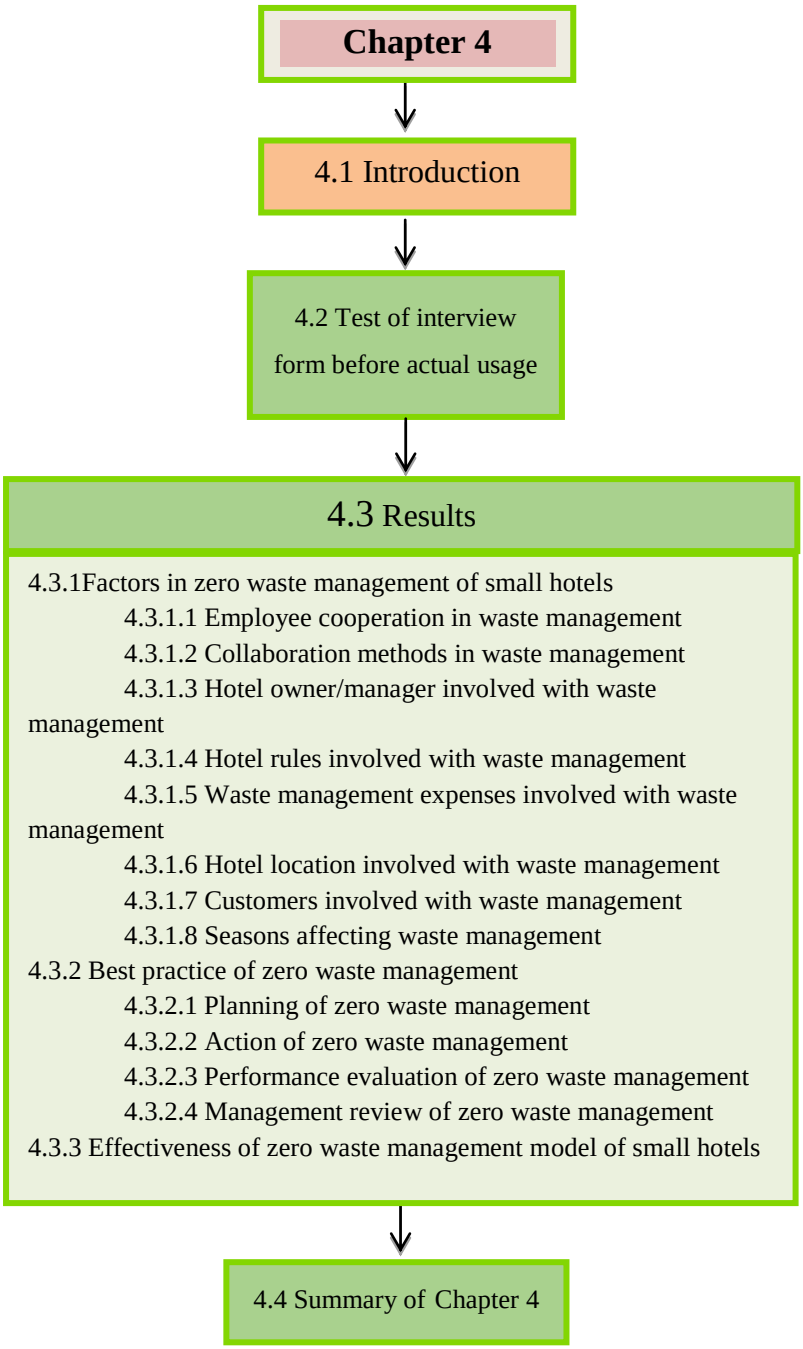

Figure 4.1 Chapter Four Structure

4.2 Pilot Test Results

This study is a qualitative research focused on the data collection process rather than building an instrument. However, the researcher also focused on creating and testing its instruments. Therefore, data collection was intended to create instruments to match the research questions and these instruments were examined for their accuracy and reliability prior to data collection. Interview form developed was distributed into the actual area during May 2014 so that the owners of small hotels considered the questions to meet the real area conditions because the concept or theory to be adopted must be adjusted to suit the research area before using these questions. However, during interviewing, these questions much be adjusted as appropriate to the situation, but still meet the research objectives and questions.

According to the interviews conducted with four owners of small hotels, including a 56-year man at Phangan Bayshore Resort, a 55-year man at Baan Panburi Resort, a 61-year woman at Long Beach Lodge, and a 49-year man at Home Bay Resort, to test the interview form before its actual usage on the zero waste management of small hotels, all questions can be used in the interview, except for question item 3.2 regarding the types of waste generated in the hotels. This question is involved with five types of waste, but the food waste can be combined with recyclable waste, and therefore there are only four types of waste involved with this question: food waste, recyclable waste, non-recyclable waste, and toxic waste, as detailed below.

Table 4.1 Presentation of Interview form for Expert's Test

Research question	Question item	Expert		
		Appropriate	Inappropriate	Not sure
Research question 1: What are the factors involved with waste management of small hotels?	1.1 How is hotel location involved with waste management?	4	0	0
	1.2 What are collaboration methods involved with waste management?	4	0	0
	1.3 How are waste management expenses involved with waste management?	4	0	0
	1.4 What are rules involved with waste management?	4	0	0
	1.5 Who are hotel owners/managers involved with waste management?	4	0	0
	1.6 How is employee cooperation involved with waste management?	4	0	0
	1.7 How are customers involved with waste management?	4	0	0
Research question 2: What is the process of zero waste management of small hotels?	2. What is the hotel's policy for zero waste management?	4	0	0
	* What is action plan?	4	0	0
	* What is objective and goal?	4	0	0
	3.1 How does the hotel reduce the amount of waste?	4	0	0
	3.2 What are the types of waste generated in hotels?	4	0	0
	* Food waste	4	0	0
	* Recyclable waste	4	0	0
	* Non-recyclable waste	4	0	0
	* Toxic waste	4	0	0
	* Material waste	1	1	2
	3.3 How does the hotel reuse the waste?	4	0	0
	3.4 How does the hotel recycle the waste?	4	0	0
	3.5 How does the hotel recover the waste?	4	0	0
	4. How does the hotel check/control the waste management action?	4	0	0
	5. How does the hotel improve its action?	4	0	0

According to Table 4.1, four experts provided their opinions towards questions used in the interview. As items 1.1–5 obtained the accuracy of 1.00 according to IC or CVR formula, it means that the questions can be used in actual interview, except for item 3.2 regarding material waste in which one expert considered appropriate, one expert considered inappropriate, and two experts considered not sure, and it obtained the accuracy of 0.00 according to IC or CVR formula meaning that this question cannot be used in actual interview (Colton & Covert 2007, pp. 75-77) as detailed below:

$$IC = \frac{\Sigma R}{N}$$

IC = Index of consistency

ΣR = Sum of expert's opining scores

N = Number of experts

Items 1.1– 5 (except for 3.2 regarding material waste)

$$IC = \frac{1+1+1+1}{4}$$

$$= 1.00$$

Item 3.2 regarding material waste

$$IC = \frac{1-1+0+0}{4}$$

$$= 0.00$$

4.3 Main Study Results

This study was given the cooperation of owners/managers or their representatives of 20 and 14 small hotels located on Koh Pha Ngan and Koh Samui, respectively, based on a basis of one person per one hotel, a total of 34 hotels/people. These interviewees can be divided by gender into 22 women and 12 men, by position into 21 hotel owner, 7 managers, and 6 employees, and by age into 40-70 years old in average as detailed below:

Table 4.2 Characteristics of Interviewees

Hotel name	Status of informant	Gender	Age
Koh Pha Ngan			
SWM 1. Phangan Bayshore Resort	Hotel owner	M	42
SWM 2. Ibiza	Hotel owner	W	61
SWM 3. Pen's Bungalow	Hotel owner	W	53
SWM 4. Baan Panburi Resort	Hotel manager	M	42
SWM 5. Haad Yao Bungalow	Hotel employee	M	37
SWM 6. Laid Back Resort	Hotel owner	W	40
SWM 7. SP Resort	Hotel employee	W	59
SWM 8. Haad Yao Over Bay Resort	Hotel manager	W	38
SWM 9. Sea Breeze Bungalow	Hotel owner	M	66
SWM 10. Neptune's Villa	Hotel owner	W	42
SWM 11. Sun Beach Bungalow	Hotel manager	W	39
SWM 12. Phangan Bayshore Resort and Spa	Hotel manager	M	37
SWM 13. Rin Beach Resort	Hotel employee	W	47
SWM 14. Island View Cabana	Hotel owner	M	54
SWM 15. Niramon Villa	Hotel owner	W	55
SWM 16. Rin Bay View	Hotel employee	W	40
SWM 17. Thongsala Guesthouse	Hotel owner	W	67
SWM 18. Grand Sea Resort	Hotel employee	M	53
SWM 19. Phangan Rainbow Bungalows	Hotel manager	W	45
SWM 20. Haad Son Resort	Hotel employee	W	53
Koh Samui			
SWM 26. Serene Hill Resort and Spa	Hotel owner	M	51
SWM 27. Nil Resort	Hotel owner	M	55
SWM 28. Lamai Resort	Hotel manager	W	44
SWM 29. Pavilion Samui Boutique Resort	Hotel owner	W	63
SWM 30. Koh Samui Resort	Hotel owner	W	50
SWM 31. Nora Buri Resort and Spa	Hotel owner	W	40
SWM 32. The White House	Hotel owner	M	62
SWM 33. Kinnaree	Hotel owner	W	64
SWM 34. Baan Chaweng Beach Resort and Spa	Hotel owner	W	53

4.3.1 Research Question 1: What are the Factors in the Zero Waste Management of Small Hotels?

According to the interviews with owners/managers/employees of 34 hotels located on Koh Samui and Koh Pha Ngan in Surat Thani, all seven factors are related to each other and support the zero waste management system. Based on the questions arranged in these interviews, these factors are: location, best practicem, expenses, regulations, owner/manager participation, employee cooperation, and customers, respectively, as detailed below:

4.3.1.1 How does the Hotel's Location Affect Waste Management?

According to the interviews about the hotel location partly contributing the waste management, there are three important points. Firstly, seaside hotels can have a lot of waste caused by storms or sea breeze and the amount of waste stuck at the hotel's beach front cannot be controlled. Secondly, for mountainside hotels, the construction of the road leading to these hotels has difficulty causing an impact on waste management as well. Thirdly, for downtown hotels with a density of the communities, their waste management will rely on burying or burning that can affect the communities. In addition, due to a small access road, the waste collection truck has difficulty in reaching these hotels. These three points are detailed below.

Firstly, seaside hotels can have a lot of waste caused by storms or sea breeze. Local beaches are beautiful and many hotels are therefore established, but the amount of waste stuck at beach front of these hotels cannot be controlled. This kind of waste includes seaweed, twigs, branches, and general waste.

> Most hotels on Koh Samui and Koh Pha Ngan are facing the beach so the beach must be clean and beautiful all the time, whether at high or low tide when the hotel staff is specially assigned to oversee the beach. The problem is that the waste floating from elsewhere is gathered in front of the hotels and during the monsoon season there is much seaweed stuck on the beach. This is a big problem every hotel is experiencing (SWM 05, 06, 09, 11, 14, 15, 18, 22, 23, 26, 29 and 31)

"Sometimes, some hotels located by the beach discard their waste into the sea, including both wet and dry waste. As a result, during low tide, this waste floats

to be stranded on the beach of other hotels nearby causing a serious damage" (SWM 08, 23 and 30)

Secondly, for mountainside hotels, the access in waste management is difficult. The waste generated by these hotels is usually branches, leaves or other natural things at a large amount, but the accessibility to bring this waste for proper destruction or management according to their properties is rare. Thus, these hotels are required to handle the waste generated in their hotels as much as possible before asking assistance from relevant authorities. Some interviewees concluded as follows:

> The amount of waste is increasing because the number of tourists is increasing. The grown trees have many leaves, as well as there are an increasing number of restaurants and activities held by these hotels. These things are all factors that affect the increasing amount of waste. Also, the natural system is not controllable so it is necessary to have more equipment to sufficiently support the waste generated, such as waste bins according to the waste types and carts used to transport the waste tok the waste management site (SWM 07, 09, 11 and 24)

Thirdly, for downtown hotels, the access in waste management is difficult. Hotels located in communities or tourist attraction areas have a lot of waste and they are adjacent to each other intensively, resulting in the access to the agencies that are responsible for waste management is difficult and thus they need a small truck or trolley to collect the waste to a bigger truck. Even the waste disposal within the hotels, such as incineration or landfill, can have an impact on neighboring communities. An interviewee (SWM 30) said that:

> Hotels in major cities generate a lot of waste. Municipality's accessibility is difficult. They usually park their big truck on road and use a small trolley to collect the waste in these hotels. They sometimes come to the hotels once in two days so the waste is putrid and affects the hotels, especially smelly food waste (SWM 24)

4.3.1.2 What are the Methods to Contribute a Successful Waste Management?

According to the interviews, there are three methods that contribute to the success of zero waste management. Firstly, the waste bins are sufficient and classified by waste type. Secondly, the waste generated is daily collected while waste is not daily collected. Thirdly, there is a specific time of waste collection. These methods are detailed below.

Firstly, the waste bins are sufficient and classified by waste type using different colors of bins with a black bag inside to provide another layer of waste support in order to facilitate the waste collection and prevent falling down. These bins are attached with a symbol and classified based on the hotel's internal and external activities. In addition, some employees suggested that the waste management activity will be well supported by the employees when there are sufficient equipments, which is the responsibility of hotel owners/managers to cater these equipments to meet the need.

"The municipality has placed the green, yellow and red bins in front of the hotel to receive different types of waste with a tight and clean lid. These bins are convenient for use" (SWM 18)

"Size, number and form of waste bins are important to support the waste management because those littering things can classify their waste effectively" (SWM 27)

> In addition to the waste bins placed in front of the hotel by the municipality, there are bins within the hotel. These bins are placed based on the activities that occur in that place, such as bins are placed in the kitchen, common toilets, and living areas near the beach (SWM 33)

"There are many devices in waste management, including waste bins and collection trucks, as appropriate, depending on the needs of the hotel itself. The hotel owners must invest in equipment to meet their needs" (SWM 17)

Secondly, the waste generated is daily collected while waste is not daily collected. The waste generated in the hotels can be divided into two types according its collection frequency. First is the waste that must be daily collected or rapidly

destroyed before becoming smelly, including waste generated from customer rooms, kitchen or dining room. Second is the waste that is not daily collected or slowly degraded, including waste generated from the hotel's garden, such as leaves, twigs and seaweed. This type of waste must wait for a higher amount or for being dry before destruction.

> The waste is daily generated by daily activities in the hotel, such as waste from food and activities. Also, there is waste that is rarely or not daily generated by activities in the hotel, such as waste from construction, parties and gardening (SWM 22)

Thirdly, as for the timing of waste collection, the best time to collect waste, especially daily generated waste, is every day. This timing can be divided into two time periods, i.e. 9:30-10:30 am. and 2.30–3.30 pm.

> Hotel cleaning staff for buildings or customer rooms will collect various types of waste at different points within the hotel and put them in a black bag tied with a rope before putting them into a waste bin in front of the hotel. The collection time is divided into two periods, i.e. 9:30-10:30 am. and 2.30–3.30 pm. (SWM 25)

4.3.1.3 What is the Plan for Expenses in Waste Management?

Implementation of a zero waste management plan requires capital investment. If a hotel has no such financial factor, its implementation of plan may be interrupted and difficult to succeed. Financial factor is thus a key factor that contributes to the success of zero waste management of the hotels. There are three points involved. Firstly, the revenue from services is used as expense in waste management. Secondly, the best practice or activity is established to save money. Thirdly, a good waste management in the long term can help reduce expenses and increase revenue of the hotel. The details are as follows:

Firstly, the revenue from services is used as expense in waste management because various activities related to waste management require funding to encourage their success. However, most small hotels have no relevant financial plans in the first place, rather they usually use the income from their operations as the budget

for this matter, which may be more or less depending on the amount of waste generated at that time and which is just a short-term planning.

> My hotel can apply waste management into the business effectively that requires the financial support and commitment. This financial capital is not prepared in advance, but we use our revenue as the expense of waste management because we must also take into account the amount of waste generated and other relevant problems (SWM 29)

"Waste management in a hotel needs a high investment in terms of collection, sorting and destruction" (SWM 34)

Secondly, the best practice or activity is established to save money. Hotel owners believe that the waste management in hotels is very important, but it requires a way to save costs on the investment as much as possible and the useful return must also be considered. Therefore, they focus on the details of activities that must provide the most benefit and on the importance of their employees at the same time.

> Waste classification requires equipment/containers that must be prepared by the hotel for ease of operation by its employees. Employees can sell the by-products obtained from this waste classification as their own income while the hotel obtains the cleanliness that can create a good image and customer's confidence for staying (SWM 15)

> Waste management is very important for the image of the hotel. However, the method of waste management must be based on its financial position in order to decide which method is most appropriate for investment. Hotel owners have to choose and decide (SWM 09)

Thirdly, a good waste management in the long term, help reduce the costs and increase revenue of the hotels if it is integrated into their services. In the first phase, there may be an increase of expenses that mainly are expenses for aiding equipment. However, in the long run, it can reduce the costs, such as water supply and electricity expenses, as well as reduce the use of natural resources.

Our hotel is focusing on recycling and on the waste classification project for plastic bottles and cardboards, etc. This kind of waste will be classified as recyclable waste that will be purchased by outsiders. This creates additional revenue for the hotel. On the other hand, the waste that is not degradable will be given to the municipality to manage it with a proper way (SWM 24)

4.3.1.4 What are the Regulations that Contribute to Waste Management?

There are two types of regulations that contribute to the zero waste management of the hotels. First are regulations from external agencies the hotel must comply with and second are internal regulations applied only within the hotel as detailed below.

Firstly, there are external regulations established by government agencies that the hotel must comply with, such as ISO 14001environmental standard. Hotels are required to comply with laws or regulations strictly; otherwise, they will be punished according to the regulations of the laws.

Our hotel has identified its environmental policy in the Mission and Commitment. This shows that the hotel focuses on the waste management. With the practice in environmental management in terms of waste according to the ISO 14001 standard, our hotel has taken various actions correctly and consistently with the laws. Therefore, it must not be charged with fines and penalties (SWM 21)

Secondly, there are internal regulations applied only within the hotel, which are unique to each hotel. These regulations aim to support the reduction and utilization of waste as well as serve as a guideline of waste management. For example, some measures are established to organize activities and projects to reduce the amount of waste generated in the hotel.

The hotel requires or encourages the reduction of waste amount by printing or photocopying both sides of paper, establishing a document/information center within the departments, using circular documents, using or sending emails, reusing papers printed on one page, buying frequently used materials or items

> at a larger size to reduce their packaging waste, buying office supplies with less packaging or reusable containers, and promoting the use of cloth bags in the distribution of consumer goods (SWM 06, 18, 19, 22, 28 and 30)

4.3.1.5 How do Hotel Owners/Managers Contribute to Waste Management?

According to the interviews conducts with the owners/managers of small hotels as to their contribution to zero waste management, there are two key issues. Firstly, the hotel owners/managers have clear targets and policies in different aspects within their organization. Secondly, the benefits to be gained from waste management include a good image, cost-saving, and friendliness for both environment and surrounding communities as detailed below.

Firstly, the hotel owners/managers have clear targets and policies in various areas within their organization. These executives have the power to determine the direction of their hotels as well as influence the core values of their hotels and establishment of targets and policies. In addition, they focus and take into account the existence of nature coupled with the growth of their hotel. As for practices in waste management, these executives should have a positive attitude and see the benefits to be gained from waste management as (SWM 05) said that:

> Hotel owners/managers are required to serve as a leader who has knowledge of waste and waste management as well as who sets the targets and policies, including presenting good ideas for their employees to follow and for customers to get involved in waste management of their hotels. (SWM 12)

Also, most hotel managers are very environmentally conscious, so they are trying to drive their business as a profitable and environmentally-friendly organization simultaneously. They set targets and policies on various aspects of their organization based on the existence of natural parallel to the growth of their business. Therefore, these hotel owners/managers are ready to invest in hotel projects and accept the concept of zero waste management. However, they believe that this zero waste management center can be achieved with the support/confidence and compliance to waste management practices as a model to create reliability among staff and personnel.

> Assuming we are a customer who is staying in a disorderly and smelly hotel, will we come back and stay in this hotel again? Hotel owners are required to overcome this problem as best as possible and the budget for this action is not much. We must find ways to manage and support the waste management in our hotel. (SWM 14)

> Cultivation of staff and management is one of the factors that affect the success of the waste management practices within hotels, such as a seminar to instill the concept of waste management, strict rules for employees to follow, and training on waste classification for employees and management so that they see the overview of waste management and understand this matter in the same direction. (SWM 32)

Secondly, the benefits to be gained from waste management include a good image, cost-saving, and friendliness for both environment and surrounding communities. All hotel owners/managers interviewed said similarly that they do not want to see the waste in their hotels because the hotel business must create an environmentally good image in the environment to have more customers. Also, one outcome that hotel business will obtain from applying the waste management in their business is to live happily between the hotels and the communities.

> Because in today's society we can live by relying on mutual cooperation in terms of both environmental stewardship and business practices between entrepreneurs and local people in the area, including other organizations involved. As possible, the hotels will hold a number of events that may be beneficial to surrounding communities. This will bring a good image of these hotels. (SWM 16)

> The hotel business cannot exist alone in the area, but there are surrounding communities or society located nearby. Since the hotel’s operations generate the waste, which will affect the surround communities and society, these hotels are required to have waste management to create a good relationship and minimize the impact on the society. (SWM 19)

> Our hotel has had no problem with the surrounding communities even we are located near these communities. We have focused on privacy and therefore planted the bamboo trees to help shield the eyes and filtering of waste resulting from incineration. Our hotel is also confident that the waste management can positively result in the sustainability of both environment and hotel itself so that our hotel can live together with the communities. (SWM 33)

4.3.1.6 What are Employee's Needs to Contribute to Waste Management?

According to the interviews with the owners/managers of hotels located on Koh Samui and Koh Pha Ngan, regarding the employee's needs to contribute to waste management, there are three important points. Firstly, employees need knowledge/understanding of the zero waste management. Secondly, employees need to communicate in their organization to receive the waste management information. Secondly, employees need to be trained in waste management. This is detailed below.

Firstly, employees need knowledge/understanding of the zero waste management because there is a lack of knowledgeable experts to educate them about waste management. According to the interviews, the hotel owners/managers should try to increase the pool of their knowledge from outside organizations as possible, such as provincial municipality, and convey the knowledge of waste management obtained to their employees to follow. How, the current practice is not as perfect as it should be.

> Hotel employees who are a foreign worker have no knowledge of the service and cleanliness. They must be trained in many areas, but the hotels still have no experts to educate this group of employees because of the language problem. (SWM 22)

In addition, the hotel personnel have no leader to lead and are not confident in the process of applying this zero waste management in their hotels. Also, the employees are responsible for customer services, so they have no time to learn more. According to the interviews and inquiries from employees, the factors in terms of knowledge/understanding of waste management are the duty of the business owner or department managers. Those leaders in waste management must be knowledgeable

in order to comply with the waste management and to classify the waste systematically as SWM 32 stated that:

"Our hotel wants to educate our employees so that they know what the type of the waste generate d is and therefore can classify the waste properly”

Secondly, as for communications in the organization to obtain the waste management information, most hotel employees have been taught to understand the zero waste management at a low level. They get this information from televisions, publications and listening to other people. Most employees never get public relations regarding zero waste management, and only some of which used to get the public relations on zero waste management from the hotel owners/managers and their colleagues. In addition, according to the inquiries about obtaining information about the zero waste management, most hotel employees believe that there should be a more thorough publicity of this information because the zero waste management is beneficial to the hotels.

> Employees receive the information about the waste problems from watching television and listening to the news on the radio. Everyone will know that bringing plastic bottles to make a sale can create additional revenue. Only very few employees used to leave their hotel to visit an exhibition on this problem held by the municipality or authorities involved. (SWM 32)

Hotel employees play a key role in waste management in their hotels because they are required to perform various waste-related operations. Therefore, they must have knowledge of the waste generated. (SWM 07)

> Most employees are Burmese people who can speck Thai slowly so the communications with them must be careful. They are willing to comply with what they are told by their boss or hotel owners provided that they must have facilities, such as tank, trolley, and broom. When cleaning is complete, it can be observed that they are happy to be involved in cleaning up the hotel because they think the hotel is also their house or accommodation as well. (SWM 26)

> The practices of waste management require cooperation from all employees because they are a key mechanism in the service and are closer to customers.

> Thus, our hotel has trained our managers in each department to understand the hotel's attitudes, policies and practices and these managers are in turn required to provide training within their departments in order to communicate these practices throughout the hotel. (SWM 06)

> Communication within the organization is one factor that contributes to the success of the zero waste management of the hotels because the correct and consistent understanding is very important. The hotels are required to provide training to their employees and personnel police with regard to the hotel's policies and good ideas of waste management so that all employees understand and realize the benefits of zero waste management to both oneself and society. Hence, the effective communication can be used to pass on the concept and encourage organizations with an effective zero waste management. (SWM 30)

Thirdly, the employees need to be trained in zero waste management. It is found that existing training courses aim to provide employees with expertise in various areas and the hotels try to include the knowledge of waste management into these training courses. However, the hotels consider that they are not yet successful as expected because their employees do not pay attention to these courses enough. Also, the employees believe that this is the responsibility of the hotel owners/managers or leaders who must convey the knowledge to them. Additionally, the hotel owners/managers think that they need a better training and communication technique to make their employees understand more.

"For waste management in the hotel, everyone must work together, including both the policy maker, namely, hotel owner/managers, and all employees in the hotel, in order to help solve the problem successfully." (SWM 30)

The involvement of hotel employees can be summarized that they should take part in thinking, planning and taking actions. The hotel sees that its employees have still no participation in waste management, so it has figured out how to make those employees involved with its environmental projects. For example, the responsible areas are allocated to employees in each department to maintain cleanliness within their departments and the employees are assigned to be responsible

for the activities defined by the hotel. This benefits both our employees and hotel itself and they feel that their hotel should be cherished and well maintained especially its cleanliness. The performance of each department is evaluated by choosing the clean areas with no waste to receive a reward and certificate of honor each year. Also, the department leaders participate in the maintenance of cleanliness by assigning their employees to be involved in helping to clean up the waste within their responsible areas at the bins provided by the hotel.

> The hotel needs to facilitate various things for waste classification, such as providing a sufficient number of different types of bins and educating and promoting the knowledge about waste management. Expense data in waste management can also contribute to the willingness of employees to classify their waste. (SWM 20)

"With regard to the problem of the hotel employees, the waste classification should be clearly encouraged to lead to the satisfaction and motivation to carry out such waste classification with the best collaboration." (SWM 06)

There are efforts to reduce the problem of employees not to cooperate that is a problem the hotel owner / managers provide more attention than other problem. This is because that the waste management can never occur without a good cooperation of the hotel employees. More importantly, the employees in most small hotels are relatives or Burmese people and therefore the force by regulations cannot be used at all, rather asking for their cooperation is better.

> Making employees participating in the waste management of the hotel is very important. Hotel owner must use a number of appropriate approaches that do not affect the service operations of the hotel and that are also suitable to the hotel's area condition. (SWM 16)

4.3.1.7 How do Customers Contribute to Waste Management?

According to the interviews with the hotel owners/hotels and employees with regard to the customer's contribution to the waste management, there are two issues. Firstly, the customers want to participate in the waste management activities

with the hotels. Secondly, the communication between executives and customers aims to create an understanding of what hotels want their customers to perform as follows.

Firstly, the customers want to participate in the waste management activities with the hotels. Customers who stay in the hotels come with the knowledge of natural resource conservation and study the information before their travel, including having a readiness to participate in various activities held by the hotels to protect the environment.

> Our hotel can apply the waste management into our business more efficiently because our customers cooperate in waste management practices even these practices can increase their workload given, such as cooperating in the use of recyclable cloth bags provided by the hotel instead of plastic bags. (SWM 10)

"Our customers highly focus on the cleanliness especially the cleanliness of the beach because they stay here because they want to experience nature from the clean sea" (SWM 34)

"Our customers prefer to travel off their shoes for a walk around the hotel by take off their shoes to feel the sand. What they are highly concerned is the sharp objects buried on the walkway" (SWM 22)

Secondly, the communication aims to create an understanding of what the hotels want their customer to follow. Most customers staying in the hotels have knowledge/understanding of waste management; however, they cannot know what methods or activities the hotels have in waste management. This problem is solved by means of communication to make customers understand such methods or activities, such as writing a signboard in English, drawing a symbolic picture, and informing by employees.

> Our hotel cannot force our customers. We can only ask for their cooperation to prevent and discard things at the bins provided. In addition, our hotel will have to figure out how to make our customers understand on what to do when staying in the hotel, such as writing a signboard in English and Thai for waste classification before discarding. Fortunately, most customers provide their cooperation very well. (SWM 12)

> Customers will follow what is announced by the hotel, such as waste classification based on the types of waste, including dry, wet and plastic wastes, and on the types of bins provided. But more importantly, the hotel needs to write it in English and it is even better if there are pictures included. (SWM 29)

4.3.1.8 How do Seasons Contribute to Waste Management?

According to the interviews with hotel owners/managers and employees involved with regard to the seasons that contribute to the waste management of the hotels located on Koh Samui and Koh Pha Ngan, there are two points, including the general seasons of tourists and the special seasons of Koh Samui and Koh Pha Ngan as detailed below.

Firstly, the seasons of tourists for Koh Samui and Koh Pha Ngan are different. Since they are located in the middle of the sea, they are easily influenced by the monsoons. Monsoons that influence these islands include the southwest monsoon causing the summer season from February to April with a clear sky and calm sea, which is the best time to tourism, and the northeast monsoon causing the rainy season from May to January when there are less customers.

> The hotel is located on Chaweng Beach, which is well-known by both Thai and foreign tourists especially during the tourist season from February to April. This beach is beautiful with many resorts, shops and restaurants. Also, there is a colorful nightlife here because tourists usually visit a number of bars and pubs. However, after these bars and pubs are closed, there are many different types and large amounts of waste left. (SWM 22)

> The amount of waste from tourists is certainly high because Rin Beach on Koh Pha Ngan hosts the Full Moon Party where many tourists come to join. After this party, they still drink at their hotels and this always happens whenever the party is held. (SWM 16)

Secondly, both monsoons influencing Koh Samui and Koh Pha Ngan can affect the hotels located next to the sea due to the waste brought up at the hotel's beach. The hotels cannot the generation of this kind of waste.

> Hotel's beach has a lot of waste in April, festivals, rainy season or storming or waving season. These include timbers, seaweed or other types of waste, both small and large in size. This waste will be left on the beach and the hotel employees need to clean it up every morning. (SWM 05)

These monsoons also have an impact on the twigs or leaves for hotels located next to a mountain with trees because the monsoons wind strongly making more branches and leaves coming.

> Branches, leaves and fruits are broken down over the road to the hotel. During the monsoon season, the hotel has to clean up or cut the branches because fruits sometimes, especially coconuts, fall against customers who stay in the hotel. (SWM 24)

4.3.2 Research Question 2: What are the Best Practices in the Zero Waste Management of Small Hotels?

According to the interviews with the owners and managers of small hotels regarding the waste management best practices to lead to the zero waste management, the following details are found:

4.3.2.1 What is the Hotel's Policy in Planning the Zero Waste Management?

According to the interviews regarding the policy in planning the zero waste management, there are two steps of this policy establishment. First is to set objectives/targets and second is to plan the actions as detailed below.

Firstly, the determination of objectives/targets to reduce the amount of waste in the hotels and to save the resources must indicate a strong commitment to reduce waste and save resources. This is because the zero waste management is a matter of how to reduce waste as much as possible, not to manage waste generated as much as possible. What must be considered is the problem of existing waste. Internal and external pressures affecting the operations of hotels include the limited resources,

laws, municipalities, neighboring people, customers, and other interested parties. In addition, the hotels must also take into account the nature of the waste generated under various categories by choosing the right approaches and considering various factors, such as budget, location of the hotels, and customer and employee cooperation. Some interviewees mentioned below:

> We must consider the volume of products that may become waste and the number of waste generations. We have to take into account the methods and budgets whether they are cost-effective. This is the purpose of waste management in the hotel. (SMW 22)

"There are responsibilities assigned for the activities of the hotel at all departments and levels of employees to help prevent and eliminate waste as well as to achieve the hotel's target of waste management." (SWM 17)

These objectives and targets must be measurable, concrete and possible as well as comply with the hotel's policy on waste management.

"Our hotel has assigned the individual responsibilities in waste management in every activity because we believe that doing so will make the work of waste management achieve the objectives and targets established." (SWM 26)

> Management should ensure that the establishment of hotel's policy on waste management based on the environmental management is appropriate to the size and does not affect the service activities of the hotel. Also, this must be publicized to everyone in the organization to implement. (SWM 06)

"Waste policy is a statement of the organization in order to identify its intention sand principle of waste operations in order to have a better environment and to set the organization's waste management targets." (SWM 23)

> Our hotel offers rooms for tourists by adhering to the responsibility of environmental conservation and reviewing and improving the waste and environmental actions continuously. In addition, we follow the laws and social regulations strictly and dispose of the waste by means of safe and proper methods based on the laws and community rules. (SWM 25)

The establishment of the hotel's waste management is committed to developing into the hotel's environmental management system of the hotel. The guidelines and plans are clearly detailed to support future changes.

> With the pressure on hotel operations from external influences, laws, market competition, neighboring people, and external interested parties, we have to pay attention on establishing the action plans by specifying clear details and responsibilities of personnel in the waste management-related activities. (SWM 09)

The establishment of objectives and targets of the hotel's waste management is involved with seven factors.

> In setting the waste management objectives, the hotel needs to consider many things. As earlier mentioned, many factors can be readily taken into account because the hotel must normally consider the laws and requirements, internal problems, financial alternatives, and customers. (SWM 05, 09, 12, 16, 22, 24, 27, 28 and 30)

Top management must define the hotel's waste policy and ensure that this policy is set under the extent appropriate to the nature, size, and environmental impact of products and services.

"Our policy adheres to the responsibility of environmental conservation, reviews and improves our actions continuously, and follows the laws, environmental regulations, and local rules strictly." (SWM 28)

"Environmental policy is committed to improving operational performance at all stages to conserve environment and natural resources." (SWM 14)

> Management must ensure that the resources needed to develop the waste management system established are practicable. These resources include the hotel's personnel who must have sufficient knowledge, skills and experiences. At the same time, it is assured that such system developed is still properly practicable. (SWM 05, 11, 16 and 28)

"There is confidence that the system developed still maintains the environmental standards." (SWM 23)

"The system developed is fairly complicated and it is difficult to explain to employees to understood and implement correctly. The hotel must have both training and experience as well as it must be written in the document." (SWM 31)

"Waste management must comply with the current problems and with the hotel's policy and targets established. The hotel will need to plan for the implementation and the system developed is consistent with such matter." (SWM. 31)

> The pressures affecting hotel operations in terms of waste management include laws, central authorities, neighboring villagers, and other interested parties. Establishment of plan or process enables us to know such pressures and how much we should focus. (SWM 09)

"Establishment of plan or process aims to identify the changes that may occur as well as the waste problems that are changed or newly created by such changes, including used in the assessment." (SWM 32)

Secondly, planning the operations can narrow the wide objectives into a specific plan that can be implemented in a more concrete way. These action plans must be consistent with the objectives and targets of the hotel and meet the nature of the problems. Perspectives of those involved can navigate towards the target, i.e. clear and measurable work performance.

"Initially, the hotel owners/managers must plan for all employees to participate in the implementation of their waste management plan in order to increase confidence that the plan will be progressing well." (SWM 20)

"Planning the actions is a very complex process depending on the size and location of the hotel. It must be able to identify what, when, who, how, and what's next." (SWM 04)

There are both short-term and long-term action plans depending on the necessity and appropriateness of the hotel in terms of waste management.

> For hotels, the situation can always change so the action plans are shortterm ones, which should respond to changing circumstances more quickly. A caution is that there should be a prioritization of things because it is not possible to achieve everything at the same time. (SWM 28)

> Planning the waste management of the hotel indicates its commitment to the development into an environmental management system. The guidelines are clearly defined and written at all aspects in order to accommodate future changes and control waste management system. (SWM 06)

1) What the hotel reduce the generation of waste?

According to the interviews with the hotel owners/managers, the reduction of waste of hotels aims to prevent before or minimize waste generation. The hotels prevent the waste generation at its source, i.e. Purchasing Department orders environmentally friendly products, such as buying products with a larger packaging instead of those with a smaller packaging to reduce the amount of packaging, and the products that their packaging can be returned to their manufacturers are used, such as beverage bottles, use of cloth bags instead of plastic bags, and repair of appliances. In addition, the hotels should encourage their employees and customers to use refillable products because using fewer products can general less waste as well as to reject or avoid the items or packaging that will create a waste problem and environmental pollution by reducing the use of some products, consuming less, and omitting superfluous items.

> Reduce the consumption of luxury goods and use sparingly, such as preparing a meal proportionally, buying a product with no several layers of packaging, using a handkerchief instead of tissue paper, and carrying a cloth bag to the market. (SWM 16)

"Deny or avoid objects or packages that can create a waste problem and environmental pollution, such as foam box or other toxic waste." (SWM 20)

> Our hotel can simply reduce the use of resources most effectively, such as eating food completely. This can reduce the high amount of waste. In addition, we may reduce the use of plastic bags and use the cloth bags instead by carrying them with us while shopping. (SWM 26)

> Buy a durable product, select a refillable product, and buy a product with a larger package instead of those with a smaller package in order to minimize the

waste after using such packaging. For example, our hotel buys the liquid soap used in the bathrooms contained in 5-liter containers that is then transferred to the refillable small containers in the bathrooms while their larger containers are used to put water for other utilizations. (SWM 32)

Our hotel is trying to avoid the order of products wrapped in several layers of packaging, such as supporting the stores that call for used packaging and buying the soap, detergent and dishwashing solution contained in a larger package because it uses less packaging compared to its volume. (SWM 32)

2) How many types of waste are there in the hotel?

According to the interviews, there are four types of waste generated in the hotels, i.e. food waste, recyclable waste, non- recyclable waste, and toxic waste. Each day, there is waste generated from the behavior of customers and employees as detailed below:

The waste classification will allow us to know how to manage each type of waste appropriately to the environment and budget or what waste should be reused. More importantly, this waste classification can reduce the waste because we will know what type of waste is still usable or is not waste as well as what type of waste is really waste. The waste classification is performed after the generation of waste and is one of the important activities within the hotel that are important for its waste recycling system.

"Waste is mainly generated from tourist's food and beverages because there are many entertainment places on the island and even all supplies or facilities finally become waste." (SWM 11)

"Waste that is not generated on a daily basis is the waste created by different activities that do not happy daily, such as waste from parties, garden and other activities where a lot of waste is generated." (SWM 31)

The waste classification can reduce contamination of recyclable materials as well as reduce the amount of waste that will be finally disposed of by incineration, bury or discarding them at the municipality. Since there is a lot of waste generated in the hotel, if it is not classified, the costs in waste

management in terms of budget, personnel, landfill site, collection and transport will be high as well. (SWM 18)

(1) Food waste

According to the interviews with the owners/managers of small hotels, the amount of food waste in highest and it is mainly generated from the hotel's kitchen or dining room. This type of waste is highly humid so it is rarely combustible, including food, meat, fruit and vegetable scraps, as well as incorruptible plant or animal remains. This type of waste will cause a putrid odor. It is also a source of germs by sticking to insects, rodents and other animals that swarm or eat this waste. Waste management of this waste can be done by putting into a separate tank awaiting the local people to use them as pig feed.

Most of the food waste is generated from the kitchen, dining room and banquet room and it will be collected in a special food tank and kept in a wet waste bin a waiting for local people to use it as animal feed, such as food, vegetable and fruit scraps. (SWM 02, 05 and 21)

There are some surplus objects arising in the hotel, especially those used in cooking for customers and employees. Food waste generated is mainly the waste of wet and semi-wet food scraps that has a lot of moisture and creates a bad odor quickly. If left overnight, it will emit a bad smell so it must be collected every day. (SWM 13)

"If it is such the waste from kitchen, such as food scraps, shrimp heads and vegetables, the hotel buries those with a very nasty odor while those with less smell will be put in a bag and discarded into a green bin." (SWM 32)

"The problem of wet waste is that the dogs usually the bins places in front of the hotel, especially shrimp heads with a very strong smell. This kind of waste must be deeply buried in a remote area from the hotel." (SWM 05)

(2) Recyclable waste

Recyclable waste is an unused material generated in the hotel that can be beneficially reused once or several times after becoming waste.

According to interviews with the owners/managers of small hotels, this kind of waste is normally generated by the behavior of customers who like drinking so there are plenty of different kinds of beer, sparkling water and other bottles. As for hotel or its employees, this kind of waste is also created by the customer's needs, i.e. the hotel is required to buy items and supplies to serve its customers. Finally, these objects become waste, such as office paper and containers of toilet cleaning solutions. Papers that only one page is used can be reused for another page or folded into paper bags for reusing again.

> After the complete use of various kinds of papers, if they are classified before selling, the price will be higher than those wholly sold in bulk, except for tissue and plastic coated papers that cannot be sold and that should be separately kept in an area that is not wet and dirty to prevent their degradation (SWM 15)

> Some types of papers can be classified by and sold to the waste purchasing businesses, including brown paper, newspaper, book paper, minor paper, fine printing paper, white and black paper, student notebook paper, and computer paper. (SWM 11)

For recyclable or sellable waste, the hotel's cleaning employees will pay a special attention to sell them to outside buyers who come in their hotel. This revenue from sale of waste will be given to these employees as a compensation or encouragement in waste management while the unsold waste will be put into a black bag to be collected by the municipality.

"Most employees focus on sellable waste, such as cans, to sell to outside buyers who come in their hotel." (SWM 01)

"Waste that can be exploited will be reused or changed into a monetary value. It will be sold to the pickup trucks passing the hotel or directly sold to an outside shop buying used materials." (SWM 06)

(3) Non-recyclable waste

According to the interviews with the hotel owners/manager, non-recyclable waste is an unused material that becomes unusable waste. It is not degradable, recyclable and food wastes, rather it is difficult to degrade and is not worth

for recycling. This type of waste is combined with other types of waste in the same bin, such as plastic bags, food-contaminated foams and foils. Hotel's employees will separate this waste from the bins waiting for being collected by the municipality.

"This waste is difficult to degrade and is not cost-effective for recycling, such as sweet plastic wraps, plastic bags, detergent packaging, candy plastics, instant noodle packaging, and food-contaminated plastic bags." (SWM 30)

"Waste will be collected into a waste collection truck. Cleaning employees will collect the waste from different sources waiting for this truck in order to transport to a waste disposal site waiting to be destroyed." (SWM 34)

Moreover, this type of waste can be created by hotel's location conditions. For example, a seaside hotel will have more waste during a monsoon season, including large timbers, seaweeds and general waste, while a mountainside hotel has some materials from trees, branch trimming for protection of customers and employees and for hotel's beautiful and green environment. These materials, such as seaweeds and leaves, caused by the hotel's location conditions are normally used as fertilizers for trees while the rest is broken into smaller pieces and send to the municipality.

> Fruits, tree branches, coconut meats, coconut shells, capoc mattress and seaweeds brought into the hotel's beachfront area by waves must be collected and classified by type waiting for the next handling. Other types of useless or non-recyclable waste are put into a black bag and discarded at the municipality. (SWM 06)

> Especially for a seaside hotel, there are many kinds of waterborne waste, including timbers, foams, bottles, plastics, and seaweeds. The hotel will classify them by type for appropriable disposal, including discarding into a bin, landfill, and incineration and use as compost for trees. (SWM 32)

> General waste includes tree barks and leaves as well as small and big wooden scraps left from a construction, materials from a repair of buildings, and leaves and grass from trimming. This type of waste will be kept at a waste storage place waiting for collection by the municipality. (SWM0 8, 11 and 21)

(4) Hazardous or toxic waste

According to the interviews with the hotel owners/managers, hazardous or toxic waste refers to an unused or used material of the hotel that becomes harmful to hotel's employees, customers and general environment, such as light bulbs, fluorescent lamps, and car and flashlight batteries.

> Toxic waste generated by the hotel includes damaged light bulbs and fluorescent lamps, expired car and flashlight batteries, pesticide and insecticide cans, lacquer and thinner containers, motor and brake oil containers, toilet cleaners, and deteriorated medicines. (SWM 16)

The hotels pay special attention to toxic waste, but there is no correct way to get rid of this toxic waste because toxic waste management requires knowledge of the properties of such waste in order to handle it properly without any harm.

> Do not mix hazardous waste with other types of waste, such as light bulbs, batteries, aerosol cans, motor oil bottles, insecticide bottles, and printing cartridges, which must be put into a bag and discarded at the municipality. (SWM 15)

Additionally, the amount of toxic waste generated in the hotels is less so it is not suitable for investment. Currently, the hotels manage this kind of waste by separating it from other wastes, putting it into a black bag, and placing it in front of the hotel waiting for being collected by the municipality's truck.

Toxic waste is harmful to health of employees, customers and other environments. Therefore, do not mix it with other wastes strictly. Rather, it must be safely disposed of. Out hotel puts this waste in a black bag and discards it to the municipality. (SWM 14)

4.3.2.2 How does the Hotel Reuse the Waste?

According to the interviews, the term "reuse" refers to that the hotels reuse their waste packaging or unused materials again in the same manner without processing or transforming by utilizing the waste as much beneficially as possible. They must learn the potential of utilization for each type of waste and the

practices/forms of waste utilization. For example, after completely using different types of papers, they are kept in a in a box for sales. Product cartons, glass bottles, especially beverage bottles, metals, steel scraps, aluminum, plastics, foams used for event signboards, are collected for other applications after use.

> After the complete use of various kinds of papers, if they are classified before selling, the price will be higher than those wholly sold in bulk, except for tissue and plastic coated papers that cannot be sold and that should be separately kept in an area that is not wet and dirty to prevent their degradation. Glass bottles can be washed for use as a water container or flower vase. Foams used for event signboards are collected for other applications after use. (SWM 15, 23 and 32)

Moreover, the hotel owners/managers further mentioned that their cleaning employees are mostly foreign workers who are least interested in the best utilization of waste. Therefore, the hotel owners/managers are responsible for encouraging those employees provide their focus on the waste more.

> In addition, the hotel reuses the waste by, for example, reusing a sweet drink bottle as a drinker waster container for employees while an empty coffee bottle is used as a sugar container. This indicates an effort of reuse before discarding as waste. (SWM 32)

4.3.2.3 How does the Hotel Recycle the Waste?

According to the interviews of the owners/managers of small hotels, the term “recycle” means to bring the waste back into a new production process to convert or change its original form for using again or to process the waste of packaging or unused material as a raw material in the production process or converting its form. In addition, recycling transforms a large unused material, such as making a dining chair for employees from wood chips from construction and making a table from a damaged bathtub. However, the hotel’s volume of recycled waste is less because of its multi-step process requiring tools and manpower so the hotels are not ready to do so.

"Our hotel has also converted and reused the waste by repairing damaged materials, such as making a coffee table from a damaged bathtub and making a lamp from a damaged device." (SWM 32)

> Use a product with no superfluous packaging and reuse the objects, such as glass bottles and paper cartons, use two pages of papers, repair things to resume their usability, avoid a material generating a waste, and convert and reuse things again by means of modification or separation of waste in order to reduce the amount of waste to be really disposed of as much as possible. (SWM 09)

In term of recycled waste management, the hotels classify this kind of waste for selling to an external used-material buyer or garbage tricycle. Hotel's cleaning employees specially focus on the recycled waste management by separating them from other types of waste. This kind of waste is mainly plastic bottles and beers that will be washed and squeezed to save space in their storage as much as possible. There are many types of plastic bottles and their buying prices are also different. Income obtained from selling this waste will be given to the hotel's cleaning staff as their morale. This is only the case of small hotel.

> Plastics, papers, bottles and metals workers are collected by the hotel's employees waiting for sales. The hotel owner does nothing with this income that is deemed an encouragement for employees, and this is also for the tidiness of the hotel. (SWM 32)

"Waste that can be exploited will be reused or changed into a monetary value. It will be sold to the pickup trucks passing the hotel or directly sold to an outside shop buying used materials." (SWM 07)

4.3.2.4 How does the Hotel Recover the Waste?

According to the interviews with the owners/managers of small hotels, the term "recovery" refers to the use of waste-related energy with most benefit. Recovered waste can be generated in every department of the hotel, but the most is kitchen department generating wet waste. Also, this kind of waste is created by both the location of seaside hotels, such as seaweeds, and the location of mountainside

hotels, such as twigs and leaves. Sample food waste includes fruit and vegetable scraps, fruit peels, meats, food scraps, wood chips, and leaves. Hotels located next to a sea will have more waste that those located next to a mountain. Mostly, there are two methods for managing this waste, i.e. making them as fertilizer and animal feed as detailed below.

Firstly, biodegradable waste is utilized as fertilizer by burying it under trees. Especially, seaweeds in a large amount can be used as fertilizer for nourishing coconut trees. Shrimp heads with a strong smell must be quickly buried under trees as fertilizer as well.

"This kind of waste can be reused as fertilizer, such as vegetable and fruit scraps, fruit peels, meats, food scraps, wood chips, leaves, and seaweed. This waste is biodegradable, perishable and quickly smelly." (SWM 13)

> Wet or organic waste is mainly generated from the hotel's kitchen and many people may think that it cannot be reused. Rather, wet waste is also reused again by converting it into an organic fertilizer or component of bio-fermented water while the remaining waste is buried as a fertilizer for plants, such as seaweeds. (SWM 06)

"Use fresh waste or food scraps as a fertilizer, such as using fish cleaning water and fish scales to nurture the trees." (SWM 10)

"Use food scraps, leaves and grasses as a fertilizer in the hotel's garden." (SWM 25)

"Wet waste can also be used to create its value by transforming it into an organic fertilizer or a component of bio-fermentation waster and the remaining waste is buried as a fertilizer for trees." (SWM 06, 10, 13, and 15)

Secondly, waste generated from the kitchen, such as water-mixed food scraps left over from eating or cooking, is put into a wet waste bin. The hotels provide the bin for this kind of waste waiting for people to get to feed their animals.

"Most food scraps come from the kitchen, dining room, banquet room and restaurant and are collected in a special bin for food scraps. Then, they are kept in a wet waste bin waiting for people to get to feed their animals." (SWM 21)

4.3.2.5 How does the Hotel Monitor/Control the Performance of Waste Management?

For monitoring the performance of waste management, the hotels have established a procedure of non-conformance control and a performance reporting schedule.

"Planning for waste management must establish a schedule to monitor and measure the progress of performance as well as report the results to appropriate supervisors." (SWM 23)

"All of the hotel's departments involved in the waste management or generation must follow and comply with the rules established by the hotel and prepare a schedule to measure and report to the hotel." (SWM 23)

Monitoring must identify the locations where the types of waste must be followed up in order to find corrective and preventive actions and measures. For example, an interview (SWM 23) said that:

> First thing that must be shown in the result of waste measurement is that which department or where in the hotel the waste is generated. Then, the type or category of waste must be known so that a repeated problem can be prevented. (SWM 23)

Measurement of waste management affects the amount of waste generated in two aspects. Firstly, it is a measurement of products used in the hotel, which may finally result in the prevention of waste generation. Secondly, the measurement of waste management aims to prevent any error according to the policies, action plans and goals established.

> Prevention of waste generation starts with an introduction of various products used to serve customers. The purchasing department plays a very important role in this regard because the hotel believes that a good waste management must start from the source of waste, namely, prevention of waste generation. (SWM 15)

> There are many different types of waste generated in many departments. Every department in the hotel has a chance to generate waste every day, but the

> number of employees involved with waste management is least. This matter is deemed a duty of housekeeping employees who have many daily assignments so the target established cannot be achieved. An additional monitoring of work is very important to have a quality work. Therefore, for waste management, when the housekeeping employees have conducted their jobs relating to waste management, there should be some people who monitor again. (SWM 27)

This monitoring aims to know error details of what, where, when, who and other information involved.

"Every problem of waste management may not be fixed in time. However, before solving each problem, it must be clearly aware that what the real cause of the problem is for best correctness and consistency." (SWM 12)

This monitoring is intended to find out the causes of errors in the zero waste management as to what, who and how to solve them.

> Improvements aim to stop, alleviate and prevent the problem from spreading. However, the corrective actions are still not enough because when one problem is solved, the same problem may occur at a new area. For example, the waste may be discarded at one bin without being classified and other bins can also experience the same problem; therefore, there must be prevention for this problem. So, the real cause must be investigated to prevent it from occurring with a continuous improvement. (SWM 22)

"Normally, there are many corrective and preventive options. The hotel considers the best solution with minimum cost and consistently with the problem at most." (SWM 15)

Also, the monitoring plan should identify responsible people, solutions and completion due date.

> There is an assignment of duties and responsibilities to resolve the problems caused by waste management. For example, for broken bins, technicians are required to make a repair or replacement. There should also be duties for preventing a recurrence. There is a follow up action to ensure that such

problem has been resolved. When the employee makes an improvement, they must report to the hotel owner/manager." (SWM 19)

Improvements aim to stop, alleviate and prevent the problem from spreading. However, the corrective actions are still not enough because when one problem is solved, the same problem may occur at a new area. For example, the waste may be discarded at one bin without being classified and other bins can also experience the same problem; therefore, there must be prevention for this problem. So, the real cause must be investigated to prevent it from occurring with a continuous improvement. (SWM 07)

For improvement, there is an assignment of duties and responsibilities to resolve a recurrence as well as to follow up in order to ensure that such problem has been completely resolved and all relevant data are collected and presented to the hotel owner/manager. (SWM 04)

4.3.2.6 How does the Hotel Perform and Improve the Performance of Zero Waste Management?

It was lound that hotel owners/managers, pay less attention on this matter. Waste management mostly ends at monitoring and only some hotels take the waste management into consideration in the hotel's meeting because they believe that it is an important way to know the problem and obtain suggestions in a reasonable timeframe to evaluate the efficiency and appropriateness of zero waste management.

A meeting of hotel owner / managers is held every week. The matter of waste management has been frequently taken into consideration because it is a major and ongoing problem. This meeting includes the reporting of last meeting, collection of complaints, and consideration of documents relating to waste management monitoring. (SWM 33)

The performance of hotel owners/managers is an important way to know the problem and obtain suggestions in a reasonable timeframe so that the zero waste

management is regularly developed. The review by hotel owners/managers should cover the following issues:

First is involved with an evaluation of efficiency and appropriateness of the zero waste management system. Hotel owners/managers should evaluate all relevant systems as well as provide support in case of problems or obstacles.

> Our hotel holds a meeting frequently because everything is not in its place under some changing circumstances. Meeting process consists of setting its agenda, reporting last meeting, starting the meeting according to its agenda, and recording meeting results. (SWM 13)

"Our hotel gets the waste management results throughout the past year consulted in the meeting to review the suitability and effectiveness as well as to provide support in case of problems and hurdles." (SWM 32)

Secondly, the problems mentioned are constantly improved and the hotel owners/managers are responsible for provide their guidance for continuous improvement and efficiency.

"The review meeting of hotel owner/managers follows up the waste management performance as assigned and reports the performance on a regular basis." (SWM 30)

> Tail does not move if head does not move. This statement describes the reviewing duty of hotel owners/managers. They must act by themselves without assigning anyone to do. However, if employees tell the real cause or defects, these hotel owners/managers can consider and find ways to improve it. (SWM 09)

According to the field research, there are issues that need to be taken into account in the performance of the executives in order to obtain clear objectives. It must ensure that the information collected is real, which means that the information brought into the performance review process by these hotel owners/managers is not just raw information. Hotel owners/managers select the information before defining their actions based on the hotel's waste management objectives and business direction.

"Our hotel checks regularly to assess whether its objectives, goals or practices established are met as well as considers the possibility of cause for improvement." (SWM 23)

"Consider how much the objectives of the hotel's waste management at its source are in line with the hotel's business operations." (SWM 17)

"Various activities held in the zero waste management are consistent with a rapid change in products, technologies, customer markets, and services." (SWM 29)

4.3.3 Research Question 3: What is the Effectiveness of the Zero Waste Management Model of Small Hotels?

The zero waste management model of small hotels located on Koh Samui and Koh Pha Ngan developed from the concepts, theories and phenomena occurred in the research areas through experiences of hotel owners/managers/people involved in the hotel's waste management was examined to determine its performance of actual applications by waste management experts, including scholars of Koh Samui Municipality, teachers, hotel owners, and those involved in waste management. According to group discussions, there are seven factors that encourage waste management: employee cooperation, supporting methods, contribution of hotel owners/managers, regulations, costs, hotel location, and customers. Group discussions concluded that these factors should be considered before the waste management takes place as detailed in Table 4.3.

> All seven factors are important that should be understood by both hotel owners and those involved with the hotel's waste management. According to this study, the waste problem is consistent to the need of everyone who wants to find a solution to solve it. (GSWM 1, 2, 3, 4, 5, 6 and 7)

The matter of policy established by the hotels to reduce the amount of waste generated was considered in both two sub-points: action plans are consistent with the policy and produce a clear result, and objectives and goals of waste management are considered appropriate. The next issue is that the practices in waste management include waste reduction, classification and reuse, usage of waste energy, and

conversion of waste for reuse to reduce the amount of waste as much as possible before its final step of burning, buying or sending to the relevant agency to manage the waste based on its properties. The meeting agreed with this issue. The next issue is about monitoring for improvement and performance review from the hotel's management to develop and improve it further. The result of group discussion stated that:

"Hotel owner is very important to be a leader in all aspects of waste management of the hotel. However, all employees in the hotel have to abide seriously by the hotel owner's policy." (GSWM 1, 2, 3, 4, 5, 6 and 7)

However, the meeting suggested additional five ideas in addition to the model developed. First is the commitment in hotel waste management of organization leader (owner) who is an important person to overcome **115**various problems and hurdles towards the goals. Second is an initiative in doing something new especially in the process of reusing waste.

"Organization needs to support a better production, such as allowing new techniques and ideas for using products that make the most of them before becoming waste." (GSWM 2, 3 and 7)

Third is problems and barriers in waste management and the organization or hotel needs to focus on waste management increasingly as well as to be more careful in its services and to be more economical. Also, the hotel must take a longer time to serve its customers and to manage its waste. This can be clearly seen from all seven meeting participants.

> Customer service personnel are already busy, but they are required to be involved with waste management. Also, since the habits of employees are traditional, it is difficult to practice them. However, with communication and training to make these employees see the importance of this matter, they will willingly cooperate with. (SWM 15)

Fourth is an establishment of good working disciplines with consistency in waste management performance, including performing their duties morally, treating own work well, and creating a trust in their own departments, as well as being a good example. These disciplines will be embedded into employees to take in their daily life.

In addition to a clean and livable hotel, they will keep their home clean and livable and the amount of waste in common society can be reduced as well.

Finally, the meeting encouraged to create a waste management model of medium and large hotels because there are a number of hotels in many sizes on Koh Samui and Koh Pha Ngan. Besides, the meeting suggested as to how to manage the hotel's waste based on local approach that is effective and saves costs.

"Deodorize the smell of fresh food waste, including shrimp heads, fishbone, and animal bones by boiling these food scraps before being buried under trees as fertilizer." (GSWM 5)

Table 4.3 shows the performance evaluation of the zero waste management model of small hotels conducted by hotel management scholars, mayor's representative, and hotel entrepreneurs, a total of 7 people. Issues were considered based on the research questions used in the interviews. According to the evaluation results, all seven evaluators agreed with the study results as details below.

Table 4.3 Performance Evaluation of Zero Waste Management Model of Small Hotels

Consideration item	Evaluation result from group discussion participants							Remark
	GSWM 1	GSWM 2	GSWM 3	GSWM 4	GSWM 5	GSWM 6	GSWM 7	
Factors contributing to waste management of small hotels								
1.1 Employee cooperation in waste management	/	/	/	/	/	/	/	
1.2 Methods contributing to waste management	/	/	/	/	/	/	/	
1.3 Hotel owners/managers contributing to waste management	/	/	/	/	/	/	/	
1.4 Regulations	/	/	/	/	/	/	/	
1.5 Costs of waste management	/	/	/	/	/	/	/	
1.6 Hotel location	/	/	/	/	/	/	/	
1.7 Customers contributing to waste management	/	/	/	/	/	/	/	
Current process of waste management at its source of small hotels								
2. Hotel's policy in planning zero waste management	/	/	/	/	/	/	/	
2.1 Operating plan	/	/	/	/	/	/	/	
2.2 Objectives and targets	/	/	/	/	/	/	/	
3.1 Reduction of waste	/	/	/	/	/	/	/	
3.2 There are four types of waste generated in hotels: food waste, recyclable waste, non-recyclable waste, and material waste	/	/	/	/	/	/	/	

Table 4.3 (Continued)

Consideration item	Evaluation result from group discussion participants							Remark
	GSWM 1	GSWM 2	GSWM 3	GSWM 4	GSWM 5	GSWM 6	GSWM 7	
3.3 Reuse of waste	/	/	/	/	/	/	/	
3.4 Recycle of waste	/	/	/	/	/	/	/	
3.5 Recovery of waste	/	/	/	/	/	/	/	
4. Monitoring/control of performance	/	/	/	/	/	/	/	
5. Improvement of performance	/	/	/	/	/	/	/	
How does zero waste management model affect hotel management in the following areas: (Balanced Scorecard , BSC)								
6. Financial view	/	/	/	/	/	/	/	
7. Customer view	/	/	/	/	/	/	/	
8. Internal process view								
9. Learning view	/	/	/	/	/	/	/	
10. Environmental view	/	/	/	/	/	/	/	

Note: GSWM 1 President of the Thai Hotels Association-Eastern South
GSWM 2 Representative of Mayor of Koh Samui City
GSWM 3 Acting for the Director of Watboontarikkaram School/Operator of Kirati Beach Resort
GSWM 4 Operator of PS Thana Resort
GSWM 5 Consultant of Mayor of Samui City Municipality/Operator of World Resort
GSWM 6 Experienced Teacher (K.S. 2) of Watphukaothong School/Operator of Na Pattara Garden Home Hotel
GSWM7 Operator of Florist Resort Koh Samui

4.4 Summary

Results of this chapter were obtained from interviews and group discussions. They started from determining the reliability of the interview form before its actual usage conducted by four experts who opined towards the interview in items 1.1–5 with the accuracy of 1.00 according to the IC or CVR formula. This indicates that the interview's questions can be used in actual interview, except for item 3.2 regarding the type of material waste that was considered appropriate by one expert, inappropriate by one expert, and unsure by two experts, and the accuracy according to the IC or CVR formula was then 0.00, which shows that this question cannot be used in actual interview. As for the results according to the first research question with regard to the factors affecting the zero waste management, the most important factor is the hotel employee's participation, followed by waste management methods, involvement of hotel owners/managers, regulations, costs, hotel location, and customers, respectively. However, every factor is correlated to each other. According to the results according to the second research question, there are four steps in the waste management process. First is an establishment of waste reduction policy of the hotel and the results of all seven factors need to be considered when establishing such policy, and a working plan is then obtained based on the reality that achieves the objectives set. Second is the waste management practice beginning with the reduction of waste by focusing on new ideas and initiatives, buying environmentally friendly products, and using products most beneficially before they become different types of waste. Waste is classified into four types, including food waste, recyclable waste, non-recyclable waste, and toxic waste. The results showed that the highest amount of waste generated in the hotels is food waste produced by the hotel's kitchen and dinning room. Each type of waste is most beneficially utilized by means of reuse, recovery, and recycling, and finally, the amount of waste generated in the hotels is reduced by such process, which achieves the objectives established. Third is a monitoring of performance errors using the procedures and corrective and preventive measures, including recording the monitoring results. Final step is the management's performance to bring errors for continuous improvement into the PDCA system.

For the third research question on the performance of the zero waste management model of small hotels, a case study in the Koh Samui, Koh Pha Ngan Surat Thani, the group discussions revealed that every point of consideration was agreed by the meeting to use such model to help reduce the current amount of waste generated. Next chapter will present the conclusions, discussions, recommendations, and implications of the study.

CHAPTER 5

CONCLUSION AND DISCUSSION

5.1 Introduction

This research aimed at examine the establishment of a good waste management model in hotel small hotels by studying the factors that contribute to the waste management. In addition, this research examined as to how to develop a zero waste management process and model that focus on the design of products based on a process of avoiding the waste generation and disposing of and returning the waste as least as possible. Research places in this study were small hotels located on Koh Samui and Koh Pha Ngan in Suratthani because they have faced a problem of excessive waste beyond their control, and since they are located next to the sea, their waste management is even more difficult. The content of this chapter is as follows:

The content starts with item 5.1 describing the overview of this chapter, followed by item 5.2 discussing the research results with three steps: 5.2.1 factors in zero waste management of small hotels, 5.2.2 waste management process, and 5.2.3 performance of zero waste management model of small hotels based on various findings of previous studies whether they are reasonably consistent or inconsistent to previous and reliable theories/previous studies with relevant explanations, item 5.3 summarizing all research results based on findings obtained that are systematically concluded and arranged according to the research questions and finally established as a complete zero waste management model for small hotels, and item 5.4 presenting the academic benefits that can be applied as practical concepts/theories as well as industrial benefits for service sector especially small hotels.

In addition, item 5.5 explains the research limitations by indicating what were found during the research and their causes and how the researcher could correct, item 5.6 describes the recommendations for future research by suggesting the new

knowledge of results to be applied in similar studies, and finally item 5.7 concludes the overall research results. Details of Chapter 5 are presented in Picture 5.1 below.

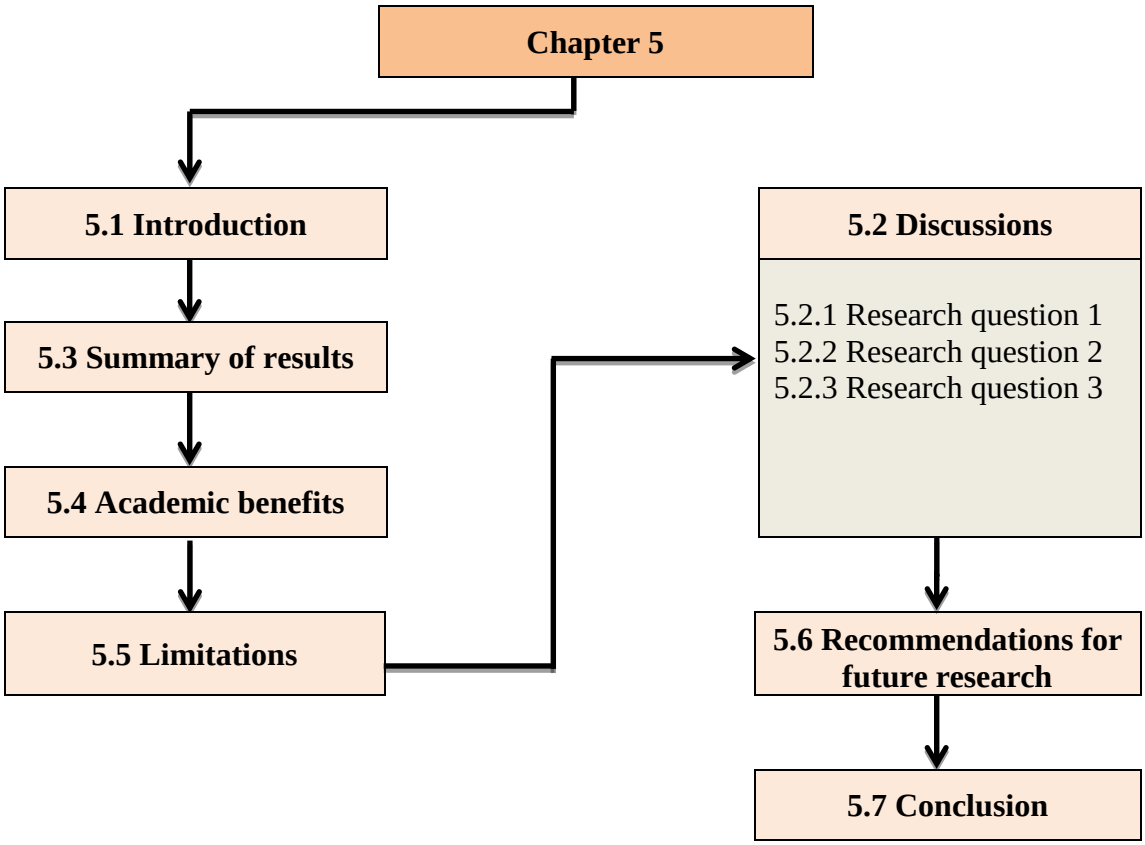

Figure 5.1 Chapter Five Structure

5.2 Discussions

Discussions of research results are arranged based on the following research questions in order to establish a good waste management model for small hotels and to achieve the objectives of this study:

1) What are the factors in zero waste management of small hotels?

2) What is the best practice in zero waste management? There are four sub-questions as follows:

   (1) How is the zero waste management planned?

   (2) What is the zero waste management operation?

   (3) How is the performance of zero waste management monitored?

   (4) How does the hotel management review the zero waste management?

3) What is the performance of zero waste management model of small hotels?

5.2.1 Discussion and Results of Research Question One

Conclusion and discussion of results from research question one aim to indicate the factors in zero waste management of small hotels. According to the results obtained, there are eight factors affecting the waste management: employee cooperation in waste management, waste management methods, hotel owners/ managers contributing to waste management, regulations, costs, hotel location, customer participation, and seasons contributing to waste management.

5.2.1.1 Employee Cooperation in Waste Management

Results in regard to employee cooperation can be concluded that what encourages employees to provide their cooperation in waste management successfully is that the hotels must provide them the knowledge and understanding of zero waste management as well as support their participation as much as possible. These results are consistent to the study of Medina (1993) who mentioned that hotel employees learn the cultivation of environmental conservation habit, realize their duty of reducing the amount of waste from various functions in their hotels, and slowly change their behavior. For example, there are services or suggestions to customers to carry or use a cloth bag instead of a plastic bag, bed sheets and bathroom cloths are replaced every two days, and some services are not provided, e.g. toothbrush and

toothpaste, while soap, shampoo and shower cream are still provided as a set. In addition, Nzeadib (2009) also stated that the hotels should encourage their employees to be knowledgeable and capable of reducing, reusing and recycling their waste. Moreover, the results reveal that a good communication from top management to all levels of employees is a very important component. A good communication regarding waste management within the organization can make the employees motivated and see the importance of their cooperation in waste management. This is consistent to the study of Ewing and Cervero (2010) who said that the employees can participate and think of waste management appropriate to their area conditions as well as plan a proper management practice if they are given a good communication and training on waste management. Similarly, Ali and Saywell (1995) showed that a proper waste management practice can be established if the employees are encouraged to realize and understand the waste classification by means of training. However, the results of this study found that the hotel personnel still lack their leader, which is similar to previous studies, because the leadership/leader in waste management belongs to the business owner or department leaders who are required to learn how to perform their waste management and then pass it to their employees to follow correctly.

5.2.1.2 Waste Management Methods

Best methods in zero waste management can be summarized into three points as follows:

Firstly, there should be waste bins provided that are sufficient and suitable to each type of waste. According to this research, the waste bins are classified into four types: food waste, recyclable waste, non-recyclable waste, and toxic waste bins. The results of this study are consistent to Sugar, Kennedy and Hoornweg (2013) who mentioned the number of waste bins that is insufficient for use in waste classification based on waste type. Waste bins used in the hotels should be classified based on waste type. They should be identified by color or name, have a tight lid, well resist to sunlight and general environment, and are removable to a waste collection truck or to discard the waste. Besides, Moore, Gould and Keary (2003) supported that some advantages of classifying waste bins by waste type are to help reduce the amount of waste because what can be reused again is deemed not a waste, to increase the safety because toxic waste will be separated out for special attention, and to

promote the tourism because waste bin classification creates an orderly and beautiful atmosphere.

Secondly, according to the results of this study, there are two methods of waste collection system: collections of daily-generated waste and non daily-generated waste. Also, a good scheduling method for waste collection was found in this study, which was rarely examined by previous studies because this study collected the data of waste management in small hotels in terms of zero waste management and previous studies were not conducted in the same manner. Thirdly, a good communication in the organization can support and create a good, proper and consistent understanding among employees to perform their waste management correctly. This is consistent to the study of Thaman, Morrison, Morrell, and Thaman (2003) who discussed that the communication in the organization is very essential to an effective waste management in which the management delivers a message of correct and complete methods or procedures to their employees to follow.

5.2.1.3 Hotel Owner/Management

Factors of hotel owners/managers contributing to waste managements can be concluded as follows. Hotel owners/managers are motivated in waste management because of benefits to be obtained, i.e. good image for their hotels, reduction of expenses, and good environmental friendship in their hotels and with surrounding communities. The results of this study are consistent to the study of Thaman, Morrison, Morrell and Thaman (2003) who mentioned that the hotel managers are important for motivating the successful waste management in their hotels and that the benefits to be obtained are good image and reduction of expenses because the amount of waste in the system will decrease, their business will be accepted by society, the opportunity will be given to increase their potential over their competitors, and a good waste management in hotels will also enhance natural resource and environmental conservation. In addition, hotel owners/managers define the targets and policies in different areas within their organization in order to maintain the nature with their business growth. The results of this study are consistent to the study of Zurbrugg (2002), Indrayana and Silas (1993), Furedy (1997) who discussed that hotel management is required to establish the strategies and measures to guide the

actions, especially the reduction and utilization of waste that need to rely on relevant measures, regulations, support and investment.

5.2.1.4 Government and Hotel Regulations

Hotel regulations regarding waste management are very important. The results found that these regulations are divided into two areas: regulations from external agencies that the hotels must follow and internal regulations that hotel employees must follow strictly. Regulations from external agencies, for example, include those from government or environmental conservation organizations, such as environmental standard and community standard. The results of this study are consistent to the study of Leitmann (1995) who stated that a standard construction of a hotel needs to follow the regulations provided by environmental agencies, such as ISO 14000 environmental standard, green hotel standard established by the Pollution Control Department, or regulations of community where the hotel is located. Also, the hotels must have their own regulations. Leitmann (1995) said that these internal regulations regarding waste management within a hotel are concerned with the cooperation of all parties in the hotel rather than with the enforcement of regulations. These regulations aim to control the generation of waste.

5.2.1.5 Waste Management Funding

Another important factor is the finance contributing to a successful waste management in hotels. Waste management comes with expenses and the hotel managers need to allot the budget to know expenses in advance. The results found that the zero waste management of small hotels lacks a good financial plan. Expenses of waste management are from income, room service charges, and other service charges collected from customers. This indicates that the high or low cost of waste management in hotels depends on the number of their customers who come to stay, and therefore their financial status for waste management is not good enough. The results of this study are consistent to the study of Steckley and Doberstein (2010) who mentioned that the hotel entrepreneurs pay their special attention in financial management for their waste management. Most small hotels do not have a financial plan for waste management since construction of their hotels. Rather, they spend money from their income each year as their waste management budget in which it will be high or low depending on the income of such year. In addition, the hotel

managers take into account the waste management activities with most benefits and cost-effective investments. This is consistent to the study of Furedy (1997) who said about the use of waste for its highest benefit by promoting the waste management activities and reusing the food waste as a minor activity in order to lead to a motivation of waste utilization and value creation that will result in the reduction of waste to be disposed of or treated as well as the reduction of waste disposal expense and the increase of income obtained from selling waste. However, if the hotel activities are integrated with the reduction of waste, a good image and reduction of expenses will eventually occur. Cointreau (1987) added that in addition to solving environmental and ecological problems within the hotels, a good waste management can benefit their business in the long run in terms of expense reduction and increase of their income.

5.2.1.6 Hotel Location

Hotel location factors contribute to the waste management. The results found that the hotels can be classified into three types by location: seaside, mountainside and urban hotels. These hotels have different problems of waste management. Seaside hotels encounter a problem of waste left on the beach that cannot be controlled because this waste is brought by waves and monsoon winds, including large timbers, branches and, more importantly, seaweeds in a large amount. Mountainside hotels have a problem of difficult accessibility in waste collection and the waste of these hotels includes branches, leaves and fruits. Urban hotels also face a problem of difficult accessibility because there are many hotels located in the same area so their waste collection can be done using a small cart in each point before combining the waste in a big truck. The results of this study are consistent to the study of Altaf and Deshazo (1996) who mentioned that mountainside or seaside hotels have an obstacle of transporting their waste for external destruction and hence they need to find ways to manage waste within their hotels as much as possible prior to external disposal. In addition, they results are consistent to the study of Ogawa (1989) who also said that seaside hotels are influenced by sea monsoons bringing the waste to their beach, which can never be controlled. Thaman, Morrison, Morrell, and Thaman (2003) stated that for hotels located next to the communities, their waste disposal must take into account the disturbance towards these communities, and for hotels

located near a river or sea, their waste disposal must take into account the discharge of waste into such river and sea.

5.2.1.7 Customers/Guests

Customer factors consist of two main issues that can contribute to a successful waste management. They are allowing customers to participate in the waste management activities and conducting public relations regarding waste management. Currently, customers are active and wish to get involved with activities in creating an environmental friendship. The results confirmed that customers are an important factor contributing to a successful waste disposal because most of them staying in the hotels want to touch the nature of sea as well as are ready to follow the environmental conservation activities provided by the hotels and to participate in the hotel's waste management. These results are consistent to the study of Weng and Fujiwara (2011) who confirmed that current customers have attitude, feeling, perception and awareness of environmental value and global warming threats and are ready to take correct and appropriate actions for waste management.

A good communication to hotel customers to understand what the hotels want is important to make them follow the proper targets. These results are consistent to Ali and Saywell (1995) who supported that a strategy that supports the hotel customers to provide their cooperation in waste management is the use of various types of communications to establish their perception, such as leaflets, signboards, brochures, posters and emails, with an aim to create their awareness and behavior of waste management.

5.2.1.8 Season

Season factors are divided into two points that affect the waste management. Firstly, the season of tourists coming to travel on Koh Samui is during February and April and during full moon festival for Koh Pha Ngan. The amount of tourists affects the generation and management of waste. This is consistent to the study of Moore, Gould and Keary (2003) who stated that the period appropriate to the tourism depends on the season appropriate to the hotel locations and this period is different in each country. This affects the amount of tourists, such as there are many tourists in the high season and there are fewer tourists in the low season. Secondly, both Koh Samui and Koh Pha Ngan get the southwestern and northeastern monsoons

that affect the amount of waste generated and waste management of the hotels. This is consistent to the study of Ewing and Cervero (2010) who noted that the season significantly affects the change in the amount of waste. For example, the season with many fruits comes with many fruit wastes (peels and seeds) because they are left by tourist consumption. In addition, Weng and Fujiwara (2011) stated that the autumn affects the amount of waste generated in the hotels located in the forestry areas and that the monsoon season causes the generation of waste for seaside hotels.

The results according to research question one regarding eight factors that affect the zero waste management of small hotels can be individually summarized in Table 5.1 below.

Table 5.1 Results Regarding Factors that Affect Zero Waste Management

Factors of waste management	Results
1. Employee cooperation in waste management	- Employees should not lack knowledge/understanding in zero waste management and should be regularly trained. - Employees should keep in touch with information in their organization in order to follow the waster management policy properly. - Employee performance should be audited after they have passed the training in order to test their knowledge and ability.
2. Waste management methods	- Waste bins are classified according to waste type - Number of waste bins must be sufficient for use. - Waste collection should be scheduled, such as collection of daily and non-daily generated waste.
3. Hotel owners/managers contributing to waste management	- Hotel owners/managers must establish targets and policies in different areas for their organization. - Hotel owners should take into account potential benefits of waster management, such as good image, cost saving, and friendship with environment and surrounding communities.
4. Hotel regulations contributing to waste management	- Regulations established by external and governmental authorities must be strictly followed. - Regulations are established and enforced within the hotel to make everyone comply with.

Table 5.1 (Continued)

Factors of waste management	Results
5. Costs in waste management	- Income from services is used as waste management expenses. - Best and cost-saving approaches or activities are established. - A good long-term waste management can help reduce expenses and increase income of the hotel.
6. Hotel location	- Waste management should be well planned according to the hotel location. - Much waste of seaside hotels is mainly introduced by monsoon or sea breeze. - Accessibility in waste management for mountainside or urban hotels is rare so it should be planned to have a convenient access.
7. Customer participation in waste management	- Customers want to participate in waste management activities with the hotels so the hotels are required to provide motivation/activities for their customers to join. - There is communication to make an understanding on what hotels want their customer to perform.
8. Season	- There are many tourists during touring seasons that affect the hotel's waste management. - Sea monsoon season affects the amount of waste in the hotel area and its management.

5.2.2 Discussion of Results of Research Question Two

Discussion of results of research question two aims to know the zero waste management of small hotels based on Deming's Theory of Plan-Do-Check-Act Cycle with the following four steps:

5.2.2.1 Plan

Establishment of a policy indicates a clear commitment of hotel owners/managers and involved people under the appropriateness based on the nature of service business and waste problem of hotels. It consists of two steps. Firstly, objectives are set for reducing the amount of waste and saving the resources. This is because the zero waste management aims to reduce the amount of waste and to utilize the waste generated as much as possible resulting in the minimum waste destruction according to the waste property. Secondly, practical short- and long-term plans are established that are consistent to the waste management policy. This is consistent to the study of Chan and Wong (2006) who mentioned that the hotel management establishes a policy leading to the adjustment of plans in the environmental management system as an inter-connected mechanism that covers all relevant problems

5.2.2.2 Do

Actions should comply with the plans established and necessarily focus on different areas based on the following five steps

Reduce: Hotels repair things for reuse, avoid using what may generate more waste, and encourage their employees and customers to refuse or avoid the use of things or packages that will cause a waste problem and environmental pollution by reducing their unnecessary consumption. This is consistent to the study of Phillips (1999) who reported as to how to reduce the waste in hotels. The hotel's Purchasing Department should buy environmentally friendly products, such as buying products in a large amount to reduce their packages because this reduction can increase the potential of recycling in the next step.

Categorize: Hotels provide a waste classification system based on the waste components and properties with an aim to reuse them. This waste classification is done from its sources by placing waste bins appropriately and sufficiently. Waste generated in small hotels can be classified into four types: food waste that is mainly

generated from the kitchen and dining room, recyclable waste that is generated from customers/rooms, non-recyclable waste that is combined with other types of waste in the same bins and, more importantly, is generated from the location of seaside hotels, including seaweeds, branches and timbers, and toxic waste that can harm employees, customers or environment and that must be managed based on its properties by external agencies. The results of this study are consistent to the study of Douglas and Judge (2001), and Lee, To, and Yu (2009) who said that the waste can be classified into four main types: rapidly degradable waste that can be fermented as compost, recyclable or reusable waste, waste other than recyclable waste, and waste contaminated with hazardous, explosive, flammable, oxide, toxic and disease-caused materials.

Reuse: Best practice for reusing or recycling the waste focuses on appropriate actions to reuse or recycle the waste as much as possible based on the potential of each type of waste with its highest benefit. Reusing used packages should take into account the utilization potential of each type of waste as well as the ways/forms of utilization of such waste. Kozak and Nield (2004) argued that the waste should be reused or recycled as much as possible based on the potential of each type of waste without affecting the recycling or reusing process. The results of this study also found that the reuse must start from the source of products and the Purchasing Department is required to consider the utilization of products that have become waste. The results are consistent to the study of Charara et al. (2011) who discussed that the reuse of hotel business must work with the Purchasing Department to buy the products designed to be used for more than one time or repair or maintain the equipment to ensure their durability.

Recycle: This refers to the management of unused materials that will become waste soon via a conversion process and the converted materials may be original or new products. Small hotels convert large materials, such as changing a bathtub into a table. However, the recycling in small hotels is mostly less because many steps require tools and workers and they usually lack these resources. The results of this study are consistent to the study of Berger (2002) who found that the potential of unused materials that can be recycled around Thailand is about 16-34 percent of the waste collected, while only 7 percent or 2,360 tons are recycled per

day, which is deemed a small figure. This recycling of waste depends on how those using them can create a new product. The management of waste that can be recycled found in the research areas is mainly involved with selling them to an outside waste buyer and the hotel's cleaning employees will highly focus on this matter. Revilla, Dodd and Hoover (2001) discussed these recyclable materials are materials that can be sold, donated/imported into a waste bank/egg exchanging activity before returning to the recycling process again.

Recovery: Recovery refers to the use of energy from waste at its highest benefit by small hotels. According to the study, this type of waste management includes two most common ways. Firstly, degradable waste is fermented as compost and buried under trees as fertilizer. The results are consistent to the study of Vila et al. (2011) who proposed the sample recovery of waste in the hotel business by reusing organic substances again without using them as solvent and fermenting them as compost. In addition, they suggested a biological conversion process and soil treatment that is useful for improvements of agriculture, trees, hotel areas or ecology. Secondly, waste is used as animal feed. Waste generated from a kitchen is mainly food waste that is mixed with water and left from eating or cooking and it is put into a wet waste bin waiting for local residents to get and use it as animal feed. The results of this study found this situation in the first time because the waste management by means of recovery by using it as animal feed is deemed a local wisdom since small hotels usually employ local people as their employees and they rely to each other.

5.2.2.3 Check

This step should reveal the details of defects in terms of what, where, when, who and how to solve them. Every improvement or correction should be reported to the hotel owners/managers or those involved. These results are consistent to the ISO 14001 environmental standard as to the examination and correction providing that an organization shall ensure its actions and corrections are correct with an examination, monitoring, measurement and written report. In addition, Kozak and Rimmington (1998) supported that the examination for the ISO 14001 environmental standard must clarify for everyone regarding their roles and duties as well as that there must be an environmental management representative who works with top management, including

a need to provide appropriate training, establish communication channels both inside and outside the organization, and document what have been done.

5.2.2.4 Action

Performance of hotel owners/managers is important to reveal the problems and advices in an appropriate time so that the zero waste management is regularly developed together with a performance evaluation, continuous improvement of problems to be in line with the policies and targets, and final implementation. The results of this study are consistent to the ISO 14001 environmental standard providing that a management review is an important process to make the management aware of the problems and able to suggest their advices and supports in case of any problem or obstacle. The management has a vital duty in guiding ways of continuous improvement. Also, Rondinelli and Vastag (2000) supported regarding the performance of management that their proper performance consistent to the ISO 14001 environmental standard makes hotel employees/managers realize the environmental effects as well as positively affects the communities next to the hotels.

5.2.3 Discussion of Research Question Three

An evaluation of performance aims to evaluate the satisfaction measures of participants towards the zero waste management model of small hotels. This is used to review the waste management of small hotel management in their long-term decision making and the results showed that every step of waste management developed was satisfied by these participants who considered that this zero waste management model could be practically applied to small hotels. This finding was obtained from data used to create the zero waste management model that were derived from interviews with hotel owners/managers or those involved with waste management, which were deemed direct and current experiences of these people. Different views in evaluating the performance of zero waste management model according to the principle of Balanced Scorecard can be summarized as follows:

Customer views towards zero waste management included the organization meeting their needs, services, reputation, image, and price of products/services. Outcomes that small hotels can obtain from implementing this zero waste management model were their good image in terms of management as an

environmental friendly hotel, promotion of their advantages, and good pricing. These results are consistent to the study of Ali and Snel (1999) who said that currently customers staying in a hotel usually learn relevant information and choose to stay in an environmental friendly hotel as well as they like to learn different activities of waste reduction provided by the hotel and to discard their waste in an area or container provided by the hotel. Weng and Fujiwara (2011) also argued that current hotel customers have attitude, emotion, thought, perception and awareness of environmental value and threats from global warming and are ready to take preventive actions based on the knowledge, understanding and proper approaches in waste management.

Internal process view is also involved with zero waste management in organizations. Applying the zero waste management model in small hotels leads to four main processes. Firstly, it is regarded as new innovation developed for waste management of hotels starting from the source of waste generation to reducing the amount of waste at the end. Secondly, it is a customer management process that can get the customers involved with the hotel's waste management. Thirdly, it is an operating process that is systematic and integrates the environmental standard and Deming's PDCA Theory, including 4Rs. Finally, it is a process of meeting the society's environmental needs and the hotel's waste management must comply with social regulations. These results are consistent to the study of Morgera and Duran (2006) who stated that the zero waste management has become an effective agenda for waste management performance in terms of natural resource use, economics and ethics.

Learning and development views towards those involved with waste management are a fundamental of achieving other objectives in other views and are correlated to the human capital concept that considers human as an important resource or asset for organizations. These views also cover intangibly valuable factors, such as knowledge, ideas, and innovations. This zero waste management model indicates that it can help develop hotel employees through waste classification activity and 4Rs so that they can perform self-development to live in a changing environment in the present time as well as can learn from their own faults to solve the problems correctly. These results are consistent to the study of Medina (1993) who mentioned that a

cultivation of environmental habits and awareness of waste reduction duty by hotels can slowly change their employee's behavior into such environmental habits.

Financial view is involved with both investment and income. Zero waste management model can help reduce the expenses of hotel's waste disposal and increase its income. In addition, hotel employees will obtain additional income from supporting waste recycling, such as selling plastic bottles and papers. Moreover, outsiders buying the hotel's waste also benefit. As a result, the hotels are positively promoted in terms of environmental and its own sustainability as well as coexist with communities. These results are consistent to the study of Cointreau (1987) who stated that in addition to reduction of environmental and ecological problems within a hotel, a good waste management also benefits the hotel's long-term business performance by decreasing its expenses and increasing its income.

Environmental view is regarding a fact that the zero waste management model applied to small hotels has a number of environmental advantages. For example, it can help reduce the amount of waste, especially excessive food waste. When the waste becomes garbage, it also comes with poor atmosphere, bad smell, and many flies as well as negatively affects the environment as it previously did by landfill. Once the zero waste management has been applied in the hotels, these problems decrease. Additionally, the hotels can have an environmental friendship within their own areas and with neighboring communities. These results are consistent to the study of Dief and Font (2010) described that the business operations of small hotels can have a severely environmental impact, especially their waste and garbage. Besides, Becklake (1991) stated that small hotels are required to get more prepared in reducing their environmental impacts by avoiding the use of landfill causing the waste degradation and thus toxic groundwater and resulting in the global warming caused by methane gas emitted. Furthermore, bad smell and flies cause a problem to surrounding communities.

5.3 Summary of Research Results

An effective implementation of zero waste management model depends on an cooperation from many or all departments or sections in a hotel and sometimes cooperation from external organizations, such as municipality or communities, so that it continues in the same direction. There are five steps in this model as follows:

Step one is involved with factors that contribute to the waste management. It starts from analyzing relevant factors ordered from most to least important ones but every factor is related to each other. The first factor is employee participation in zero waste management. It is very important in a way that if employees do not provide their cooperation, the hotel's waste management cannot happen and what must be considered in this matter includes providing knowledge and understanding of zero waste management and internal communication to perceive waste management data. The second factor is best practice of waste management and what must be considered in this matter include classifying waste bins by waste type, providing a sufficient number of bins, collecting waste that is daily and not daily generated, and scheduling waste collection times.

The third factor is the contribution of hotel owners/managers in waste management by establishing the targets and policies in different areas for their hotels and what must be considered in this matter includes benefits to be obtained from waste management, including a good image, cost-saving, and environmental friendship within their own areas and with neighboring communities. The fourth factor is the hotel's regulations contributing to the waste management and what must be considered in this matter include both regulations from external agencies that the hotels must comply with, such as ISO 14001 environmental standard, and internal regulations established by the hotels. The fifth factor is expenses of waste management and what must be considered in this matter include spending the income from services as expenses of waste management and establishing the best and cost-saving practice or activity, including a good long-term waste management can help reduce other relevant expenses and increase income. The sixth factor is the hotel's location and what must be considered in this matter includes a difficult accessibility for waste management for mountainside, seaside and urban hotels. The seventh factor

is customer's involvement in waste management. The final factor is the season of tourists and the season of nature and what must be considered in this matter includes the customer's need to join waste management activities with the hotels through an effective communication to make them understand what the hotels require them to follow. These factors are considered with the activities of existing services and products to evaluate current waste-related problems in the hotels in order to set the policies and targets in the same direction as well as to adjust the data according to current situations.

Step two is involved with establishing a policy with the following process:

Plan is about policy formulation by learning relevant data, such as customer's expectations and needs, weakness and disadvantages of organization, budget, and other related data, i.e. eight factors mentioned above. These data can be analyzed with previous performance to determine the action framework and approaches in the future in the forms of policy, objectives, targets and plans of the organization. Then, the policy must be publicized to different departments in the hotel for their implementation.

Implementation of policy refers to responsible people implementing the policy according to the process and procedure specified. It is divided into two phases: (1) learning and training for employees to understand the working process of waste utilization and (2) action based on such working process. This action will be carried out in the next step.

Step three is involved with action. The hotels should identify their personnel to attend the training of zero waste management or analyze and consider those eligible for such training. Personnel working with water problems must be properly trained. In addition, the hotels should determine a way to make their employees or members or those involved in each function in their hotels aware of the waste problems and benefits of zero waste management. Moreover, hotel employees are required to indicate appropriate processes and activities and the products to be used in their hotels must be environmental friendly. When these products have been fully utilized in the hotels, they will become four types of waste, including food waste, recyclable waste, non-recyclable waste, and toxic waste. Then, these wastes are classified by type for

further utilization by means of reuse, recovery, and recycling according to the waste properties. This relies on the invention creativity for using them as appropriate.

Step four is involved with examination. The hotels should define their examination methods in writing for activities that can have a significant impact on waste management. There is also a performance evaluation to see if the performance meets the targets established. If the performance does not meet these targets, the cause must be investigated to determine corrective and preventive actions to prevent its reoccurrence. When top management is informed of performance results, they are required to find corrective measures so that the employees and various functions in different departments within the hotels are able to achieve the targets better.

Step five is involved with performance of hotel owners/managers. They must review the zero waste management system in a reasonable period to ensure that their performance is continuous, and adequate, and effective. This review process consists of a collection of necessary data for next review and a recording of meeting agenda regarding zero waste management review that will help improve the system. Then, the action is taken and checked whether it meets the plans and is effective. This process is carried out according to the PDCA cycle and is in line with the financial status or cost appropriate to the hotels. The process of zero waste management can be depicted in the picture below.

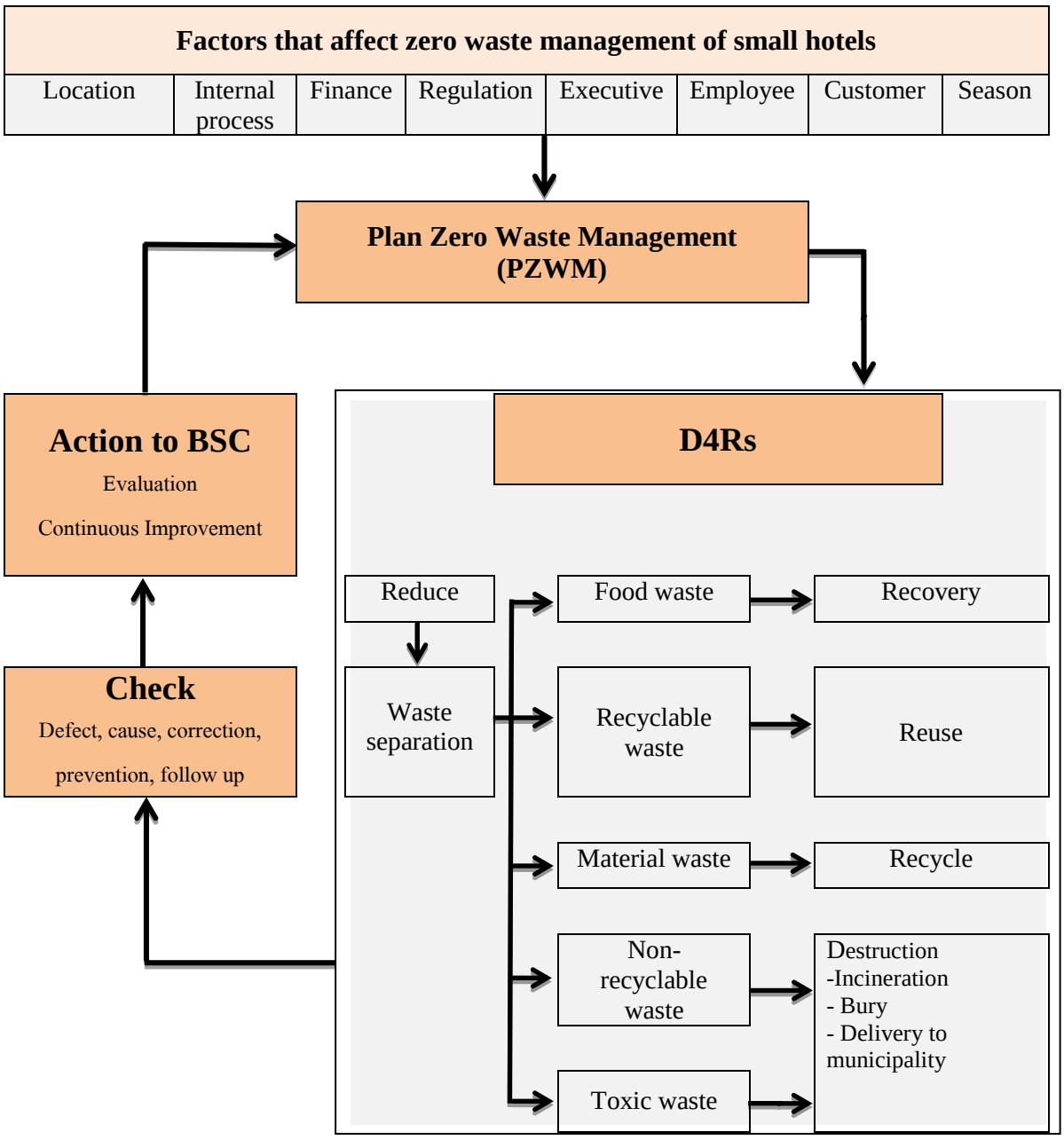

Figure 5.2 Model Zero Waste Management of Small Hotels

5.4 Contributions of the Study

The contribution of this research can be divided into academic and service industrial benefits. Academic benefits can be divided into three aspects. Firstly, this study has created a policy of waste management quality for small hotels with a clear process: factors affect the waste management, policy formulation, implementation, examination, and performance of hotel management, respectively.

Secondly, this study has created a policy of zero waste management for small hotels with a hierarchy, including reduction of waste at its source by classifying the waste into four types (food waste, recyclable waste, non-recyclable waste, and toxic waste), reuse of waste, recycling of waste, and recovery of waste. The finally remaining waste, which is in a fewer amount, is destroyed according to its properties.

Thirdly, this study has created a research guideline for other researchers regarding waste management for different sizes of hotels in order to increase the potential of environmental friendship.

Service industrial benefits obtained from this research can be divided into four aspects. Firstly, the hotels with a good zero waste management, in terms of money, can reduce their costs or expenses used in their waste management and increase their income from selling the waste. In terms of non-money, this zero waste management enables the hotels to have good relationship with their neighboring communities and co-exist sustainably, including complying with environmental laws and having a good image.

Secondly, the small hotel's zero waste management can be applied to other types of hotels or service-related businesses, such as spa business. These businesses can use their products at most benefits as well as still conserve the nature sustainably leading to the pride of both hotels and their personnel.

Thirdly, hotel employees have an understanding and awareness of cleanliness cultivated by daily waste management activities, which will result in good living behaviors and improve their neighboring communities and society.

Fourthly, the results found that the success of waste management is partly caused by employee cooperation so the hotel management can use this zero waste

management model for small hotels as a tool to educate their employees to have a waste management capability.

5.5 Limitations of the Study

In interviews for data collection, there were many obstacles as follows:

As for cooperation of interviewees, the researcher contacted 100 hotels for interviewing, but only 40 hotels agreed. This was because these contacts were relatively difficult since a process of asking for interviewing must be involved with many departments and a letter must also be sent to the hotel owners/managers to provide their approval. These steps took a considerable period of time as well as some hotels lacked their waste management. The researcher tried to contact them many times, but due to a limited research time, the researcher could conduct an interview with 34 small hotels located on Kho Samui and Koh Pha Ngan.

With regard to company's confidential data, due to a presence of many competitors in hotel business, the provision of in-depth business data, such as hotel's financial data and long-term planning, was not much cooperated by interviewees.

With these limitations, there are still three points regarding zero waste management model of small hotels that should be further studied. Firstly, a detailed study should be conducted to survey and establish a database of waste and waste management of general small hotels by focusing on their waste transport and disposal systems and other properties relating to the hotel's waste management. Secondly, a research should be conducted to determine the generation rate of waste at its source against the amount of tourists staying in small hotels and the relationship between the amount of waste generated and the social variables, i.e. number of hotel customers, income, and personal expenses. Finally, a detailed study should be conducted to examine the effects towards formal systems once the government uses an economic tool or legal measure to make the waste management more formal.

5.6 Recommendations for Future Research

This study aims to examine the driving factors, obstacles and supports with regard to an introduction of zero waste management model into small hotels by only focusing on determining the relationship between the waste management and the business operation under a context of small hotels located on Koh Samui and Koh Pha Ngan in the south of Thailand.

Therefore, the researcher believes that if there should be a detailed research examining the relationship between the waste management and the business performance of small hotels in a larger research area, such as national or international level, in order to indicate the similarity and difference in business concepts among small hotels in each province or country because they inevitably have different business values and cultures. In addition, there should be a study on the driving factors, obstacles and supports with regard to an introduction of wastewaters, noise pollution, and energy saving managements into small hotels in order to find their common points of attitude at each type of environmental problems as well as to indicate the awareness of environmental importance in the view of environmentally friendly small hotels.

5.7 Summary

This is the final chapter of this research that shows the overview of the results consisting of discussions of seven factors that support zero waste management and the results also found sub-factors in them. Three top factors include employee participation, waste management methods, and performance of hotel owners/managers, respectively. In addition, the results indicated that every factor is impostant related to each other and the zero waste management in small hotel and also greatly impact can be used for management.

There are four steps (PDCA) in the zero waste management process. Plan consists of two sub-steps: setting the objectives/targets and having action plans; Do includes reduce, reuse, recovery and recycle of waste, and the final waste that cannot be used at all must be destroyed by burying, burning or discarding to the municipality;

Check is involved with knowing the details of defects and causes as well as knowing what are they, whom they are involved with, how to correct them, and when to finish the correction; Action means following up the progress and evaluating the performance and appropriateness of zero waste management system

This zero waste management model was developed by integrating the results from both research questions, which includes five steps: analysis of factors contributing to waste management, establishment of a policy that is in line with the hotel's service business, classification of waste by its type and implementation of 4Rs, examination, and review of waste management by hotel owners/managers.

However, the process of this research leading to the zero waste management model for small hotels (a case study in the Koh Samui, Koh Phangan Surat Thani) is under a Ph.D. study. The results of this research can thus be used to improve the service industry, especially small accommodations, in order to improve or further the current knowledge as well as to promote the tourism industry.

BIBLOGRAPHY

Aagreh, Y., & Al-Ghzawi, A. (2013). Feasibility of utilizing renewable energy systems for a small hotel in Ajloun city, Jordan. *Applied Energy*, *103*(March), 25-31. doi:10.1016/j.apenergy.2012.10.008

Abu-Taleb, A. A., Alawneh, A. J., & Smadi, M. M. (2007). Statistical analysis of recent changes in relative humidity in Jordan. *American Journal of Environmental Sciences*, *3*(2), 75-77. doi:10.3844/ajessp.2007.75.77

Alexander, S., (2002). Green hotels: Opportunities and resources for success. Retrieved from http://docplayer.net/14204743-Green-hotels-opportunities-and-resources-for-success.html

Ali, M., & Saywell, D. L. (1995). Community initiatives in solid waste. *Proceedings of the 21st WEDC Conference, Kampula, Uganda*. Retrieved from https://dspace.lboro.ac.uk/2134/2104

Ali, M., & Snel, M. (1999). Lessons from community-based initiatives in solid waste. (WELL Study Task No. 99). Retrieved from http://www.lboro.ac.uk/well /resources/well-studies/summaries-htm/task0099.htm

Altaf, M. A., & Deshazo, J. R. (1996). Household demand for improved solid waste management: A case study of Gujranwala, Pakistan. *World Development*, *24*(5), 857-868. doi:10.1016/0305-750x(96)00006-x

Arasli, H. (2002). Gearing total quality into small-and medium-sized hotels in North Cyprus. *Journal of Small Business Management, 40*(4), 350-359. doi:10.1111/1540-627x.00062

Arimura, T. H., Hibiki, A., & Katayama, H. (2008). Is a voluntary approach an effective environmental policy instrument?: A case for environmental management systems. *Journal of Environmental Economics and Management*, *55*(3), 281-295. doi:10.1016/j.jeem.2007.09.002

Arlosoroff, S. (1985). WB/UNDP—Integrated resource recovery project: Recycling of wastes in developing countries. In K. Curi (Ed.), *Appropriate Waste Management for Developing Countries* (pp. 81-94). New York: Plenum press.

Avelini Holjevac, I., & Vrtodusic, A. (1999). Small hotels in European tourism: The necessity of reconstruction of Croatian hotel industry. *The Tourist Review, 54*(4), 43–49. doi:10.1108/eb058321

Ayres, R. (2000). Tourism as a passport to development in small states: Reflections on Cyprus. *International Journal of Social Economics*, *27*(2), 114-133. doi:10.1108/ 03068290010308992

Azzone, G., Brophy, M., Noci, G., Welford, R., & Young, W. (1997). A stakeholders' view of environmental reporting. *Long Range Planning, 30*(5), 699-709. doi:10.1016/S0024-6301(97)00058-7

Bacot, H., McCoy, B., & Plagman-Galvin, J. (2002). Municipal commercial Recycling Barriers to Success. *The American Review of Public Administration, 32*(2), 145-165. doi:10.1177/02774002032002002

Baker, S., Bradley, P., & Huyton, J. (2000). *Principles of hotel front office operations* (2nd ed.). London: Continuum.

Baker, S., & Vandepeer, B. (2004). *Deployed force waste management*. Edinburgh, Australia: DSTO Systems Sciences Laboratory. http://dspace.dsto.defence.gov.au/dspace/handle/1947/3726

Ball, S., & Taleb, M. A. (2011). Benchmarking waste disposal in the Egyptian hotel industry. *Tourism and Hospitality Research, 11*(1), 1-18. doi:10.1057/thr.2010.16

Banner, D. J. (2010). Qualitative interviewing: Preparation for practice. *Canadian Journal of Cardiovascular Nursing, 20*(3), 27-34.

Bangkok Metropolitan Administration. (2013). Guidelines of waste management in hotel. Retrieved from http://203.155.220.174/modules.php?name=News&file=article&sid=154

Barbour, R. S., & Schostak, J. (2005). Interviewing and focus groups. In B. Somekh & C. Lewin (Eds.), *Research methods in the social sciencs.* London: Sage.

Bartone, C. R., Leite, L., Triche, T., & Schertenleib, R. (1991). Private sector participation in municipal solid waste service: Experiences in Latin America. *Waste Management & Research, 9*(1), 495-509. doi:10.1177/0734242x910090017

Beaver, G. (2002). *Small business, entrepreneurship and enterprise development*. Harlow: Financial Times/Prentice Hall.

Beccali, M., La Gennusa, M., Lo Coco, L., & Rizzo, G. (2009). An empirical approach for ranking environmental and energy saving measures in the hotel sector. *Renewable Energy*, *34*(1), 82-90. doi:10.1016/j.renene.2008.04.029

Becklake, S. (1991). *Green issues thinking for the future waste disposal and recycling*. London: Aladdin Books.

Berger, K. R. (2002). Consumer choices can reduce packaging waste. Retrieved from http://ufdcimages.uflib.ufl.edu/IR/00/00/15/29/00001/AE22600a.pdf

Bernard, H. R. (1994). *Research Methods in Anthropology: Qualitative and Quantitative Merthods* (2nd ed.). Thousand Oaks, CA: Sage.

Bogdan, R., & Taylor, S. J. (1975). *Introduction to qualitative research methods: A phenomenological approach to the social sciences*. New York: Wiley.

Bohdanowicz, P. (2005). European hoteliers' environmental attitudes greening the business. *Cornell Hotel and Restaurant Administration Quarterly*, *46*(2), 188-204. doi:10.1177/0010880404273891

Bohdanowicz, P. (2006). Environmental awareness and initiatives in the Swedish and Polish hotel industries—survey results. *International Journal of Hospitality Management*, *25*(4), 662-682.

Boiral, O., & Sala, J.-M. (1998). Environmental management: Should industry adopt ISO 14001? *Business Horizons*, *41*(1), 57-64. doi:10.1016/s0007-6813(98)90065-9

Bovea, M. D., & Powell, J. C. (2006). Alternative scenarios to meet the demands of sustainable waste management. *Journal of Environmental Management*, *79*(2), 115-132. doi:10.1016/j.jenvman.2005.06.005

Bridge, S., O'Neill, K., & Cromie, S. (2003) *Understanding enterprise, entrepreneurship and small business* (2nd ed.). New York: Palgrave MacMillan.

Brodersen, D. E., Clemons, W. M., Carter, A. P., Wimberly, B. T., & Ramakrishnan, V. (2002). Crystal structure of the 30 s ribosomal subunit from Thermus thermophilus: Structure of the proteins and their interactions with 16 s RNA. *Journal of Molecular Biology*, *316*(3), 725-768. doi:10.1006/jmbi.2001.5359

Budge, A., Irvine, W., & Smith, R. (2008). Crisis plan? What crisis plan! How micro entrepreneurs manage in a crisis. *International Journal of Entrepreneurship and Small Business*, *6*(3), 337–354. doi:10.1504/ijesb.2008.019131

Buhalis, D., & Cooper, C. (1998). Small and medium sized tourism enterprises at the destination. In E. Laws, B. Faulkner, & G. Moscardo (Eds.), *Embracing and managing change in tourism: International case studies.* London: Routledge.

Buick, I., Halcro, K., & Lynch, P. (1998). Scottish hospitality enterprises and their networks. *Proceedings of the International Council of Small Business (ICSB) Conference*, Singapore. Retrieved from https://sites.google.com/a/uca.edu /sbanc/icsb-1998

Byer, P. H., Hoang, C. P., Nguyen, T. T. T., Chopra, S., Maclaren, V., & Haight, M. (2006). Household, hotel and market waste audits for composting in Vietnam and Laos. *Waste Management & Research*, *24*(5), 465-472. doi:10.1177/0734242x06068067

Canoves, G., Villarino, M., Priestley, G. K., & Blanco, A. (2004). Rural tourism in Spain: An analysis of recent evolution. *Geoforum*, *35*(6), 755-769. doi:10.1016/j.geoforum.2004.03.005

Chai Photisita., C. *(*2009). *The art and science of qualitative research* (4th ed.). Bangkok: Amarin Printing & Publishing. (In Thai).

Chan, E. S. W. (2008). Barriers to EMS in the hotel industry. *International Journal of Hospitality Management, 27*(2), 187–196. doi:10.1016/j.ijhm.2007.07.011

Chan, E. S. W, & Wong, S. C. K. (2006). Motivations for ISO 14001 in the hotel industry. *Tourism Management*, *27*(3), 481-492. doi:10.1016/j.tourman.2004.10.007

Chan, W.W., & Lam, J. C. (2001). Environmental accounting of municipal solid waste originating from rooms and restaurants in the Hong Kong hotel industry. *Journal of Hospitality & Tourism Research*, *25*(4), 371–385. doi:10.1177/109634800102500402

Chan, W. W., & Lam, J. C. (2002). Prediction of pollutant emission through electricity consumption by the hotel industry in Hong Kong. *International Journal of Hospitality Management*, *21*(4), 381-391. doi:10.1016/s0278-4319(02)00027-0

Chanen, J. S. (2004). Becoming book smart. *ABA Journal*, *90*(5), 56-57.

Charara, N., Cashman, A., Bonnell, R., & Gehr, R. (2011). Water use efficiency in the hotel sector of Barbados. *Journal of Sustainable Tourism*, *19*(2), 231-245. doi:10.1080/09669582.2010.502577

Chesebro, J. W., & Borisoff, D. J. (2007). What makes qualitative research qualitative? *Qualitative Research Reports in Communication*, *8*(1), 3-14. doi:10.1080/17459430701617846

Cointreau, S. J. (1987). *Solid waste recycling: Case studies in developing countries*. Washington, DC: World Bank.

Cointreau, S. J., Gunnerson, C. G., Huls, J. M., & Seldman, N. N. (1984). *Recycling from municipal refuse: A state-of-the-art review and annotated bibliography*. Washington, DC: World Bank. Retrieved from http://documents.worldbank.org/curated/en/907271467997294000/pdf/WTP30000Recycl0notated0bibliography.pdf

Cointreau, S. J., & Mundial, B. (1982). *Environmental management of urban solid wastes in developing countries: A project guide*. Washington, DC: World Bank.

Colton, D., & Covert, R. W. (2007). *Designing and constructing instruments for social research and evaluation*. San Francisco, CA: Jossey-Bass.

Connett, P., & Sheehan, B. (2001). *A citizen's agenda for zero waste*. Canton, NY: GRRN. Retrieved from http://archive.grrn.org/zerowaste/community/activist/citizens_adenda_4_print.pdf

Cooper, D. R., & Schindler, P. S. (2003). *Business research methods* (8th ed.). Boston: McGraw-Hill/Irwin.

Cooper, P. F., & Findlater, B. C. (Eds.). (1990). Constructed wetlands in water pollution control. *Proceedings of the International Conference on the use of Constructed Wetlands in Water Pollution Control, Held in Cambridge, UK*, September 24–28, 1990. Oxford: Pergamon.

Corbin, J. M, & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). Thousand Oaks, CA: Sage.

Couth, R., & Trois, C. (2012). Sustainable waste management in Africa through CDM projects. *Waste Management*, *32*(11), 2115-2125. doi:10.1016/j.wesman.2012.02.022

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage.

Cummings, L. E. (1997). Waste minimisation supporting urban tourism sustainability: A mega-resort case study. *Journal of Sustainable Tourism*, *5*(2), 93-108. doi:10.1080/09669589708667279

Curlo, E. (1999). Marketing strategy, product safety, and ethical factors in consumer choice. *Journal of Business Ethics*, *21*(1), 37-48.

Curran, J., Blackburn, R. A., & Woods, A. (1991). *Profiles of the small enterprise in the service sector*. Kingston upon Thames, Surrey England: ESRC Centre for Research on Small Services Sector Enterprises.

Dalton, G. J., Lockington, D. A., & Baldock, T. E. (2008). Feasibility analysis of stand-alone renewable energy supply options for a large hotel. *Renewable Energy*, *33*(7), 1475-1490. doi:10.1016/j.renene.2007.09.014

De Grosbois, D. (2012). Corporate social responsibility reporting by the global hotel industry: Commitment, initiatives and performance. *International Journal of Hospitality Management*, *31*(3), 896-905. doi:10.1016/j.ijhm.2011.10.008

Del Mar Alonso-Almeida, M., & Rodríguez-Antón, J. M. (2011). Organisational behaviour and strategies in the adoption of certified management systems: An analysis of the Spanish hotel industry. *Journal of Cleaner Production*, *19*(13), 1455-1463. doi:10.1016/j.jelepro.2011.04.015

Deming, W. E. (1982). *Quality, productivity and competitive position*. Cambridge, MA: MIT, Center for Advanced Engineering Study.

Denzin, N. K. & Lincoln, Y. S. (Eds.). (1994). *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

Department of Provincial Administration. (2014). Report of hotel system. Retrieved from http://dpa.dopa.go.th/DPA/hotel_report.php

Deya Tortella, B., & Tirado, D. (2011). Hotel water consumption at a seasonal mass tourist destination. The case of the island of Mallorca. *Journal of Environmental Management, 92*(10), 2568-2579. doi:10.1016/j.jenvman.2011.05.024

Dief, M. E., & Font, X. (2010). The determinants of hotels' marketing managers' green marketing behaviour. *Journal of Sustainable Tourism, 18*(2), 157-174. doi:10.1080/09669580903464232

Dileep, M. R. (2007). Tourism and waste management: A review of implementation of "zero waste" at Kovalam. *Asia Pacific Journal of Tourism Research, 12*(4), 377-392. doi:10.1080/10941660701823314

Doody, H. (2010). What are the barriers to implementing environmental practices in the Irish hospitality industry? In Tourism and Hospitality Research in Ireland Conference (THRIC). Retrieved from http://www.shannoncollege.com/wp-content/uploads/2009/12/THRIC-2010-Full-Paper-H.-Doody.pdf

Douglas, T. J., & Judge, W. Q. (2001). Total quality management implementation and competitive advantage: The role of structural control and exploration. *Academy of Management Journal, 44*(1), 158-169. doi:10.2307/3069343

Erdogan, N., & Baris, E. (2007). Environmental protection programs and conservation practices of hotels in Ankara, Turkey. *Tourism Management, 28*(2), 604-614. doi:10.1016/j.tourman.2006.07.003

Evans, T. M. (2005). *The study of environmental awareness and waste minimization Approaches for Hotel Management in Belize* (Unpublished master's thesis). National Central University, Taiwan.

Ewing, R., & Cervero, R. (2010). Travel and the built environment. *Journal of the American Planning Association, 76*(3), 265-294.

Feenberg, D., & Mills, E. S. (1980). *Measuring the benefits of water pollution abatement*. New York: Academic Press.

Furedy, C. (1997). Household-level and community actions for solid waste management and recycling in Asian cities: Recent research and projects. In A. Fernandez, K. Oya & D. Dungate (Eds.), *Recycling in Asia: Partnerships for responsive solid waste management* (pp. 13-25). Nagoya: United Nations Centre for Regional Development.

Ganguly, P. (1985). *UK small business statistics and international comparisons*. London: Harper & Row.

Gardiner, J. K. (2003). Christina stead and the synecdochic scam: The little hotel. *Journal of the Association for the Study of Australian Literature, 2*, 13-28.

Geiser, K. (2001). *Materials matter: Toward a sustainable materials policy*. Cambridge, MA: MIT Press.

Gilley, K. M., Worrell, D. L., Davidson, W. N., III, & El–Jelly, A. (2000). Corporate environmental initiatives and anticipated firm performance: The differential effects of process-driven versus product-driven greening initiatives. *Journal of Management*, *26*(6), 1199-1216. doi:10.1177/014920630002600607

Glaser, B. G. (1978). *Theoretical sensitivity: Advances in the methodology of grounded theory*. Mill Valley, CA: Sociology Press.

Glaser, B. G. (2001). *The grounded theory perspective: Conceptualization contrasted with description.* Mill Valley, CA: Sociology Press.

Goh Eng, A., Suhaiza, Z., & Nabsiah Abd, W. (2006). A study on the impact of environmental management system (EMS) certification towards firms' performance in Malaysia. *Management of Environmental Quality: An International Journal*, *17*(1), 73-93. doi:10.1108/14777830610639459

Goss, D. (1991). *Small business and* society. London: Routledge.

Goswami, S. (2009). Road traffic noise: A case study of Balasore town, Orissa, India. *International Journal of Environmental Research*, *3*(2), 309-318.

Graci, S., & Dodds, R. (2008). Why go green? The business case for environmental commitment in the Canadian hotel industry. *Anatolia*, *19*(2), 251-270. doi:10.1080/13032917.2008.9687072

Green, A., Williams, G., Neale, R., Hart, V., Leslie, D., Parsons, P., … Russell, A. (1999). Daily sunscreen application and betacarotene supplementation in prevention of basal-cell and squamous-cell carcinomas of the skin: A randomised controlled trial. *The Lancet*, *354*(9180), 723-729. doi:10.1016/s0140-6736(98)12168-2

Hajkowicz, S. (2006). Cost scenarios for coastal water pollution in a small island nation: A case study from the Cook Islands. *Coastal Management*, *34*(4), 369-386. doi:10.1080/08920750600860233

Hall, G. M., & Howe, J. (2012). Energy from waste and the food processing industry. *Process Safety and Environmental Protection*, *90*(3), 203-212. doi:10.1016/j.psep.2011.09.005

Hallberg, G. R. (1989). Pesticides pollution of groundwater in the humid United States. *Agriculture, Ecosystems & Environment*, *26*(3-4), 299-367. doi:10.1016/0167-8809(89)90017-0

Hamza, A. A. (2006). *Case studies of American women academicians in the Arab countries of the Gulf Region: Cultural adaptation and contribution to the globalization of higher education* (Unpublished doctoral dissertation). Texas Tech University, Texas.

Han, X., & Naeher, L. P. (2006). A review of traffic-related air pollution exposure assessment studies in the developing world. *Environment International*, *32*(1), 106-120. doi:10.1016/j.envint.2005.05.020

Harrison, L., & Johnson, K. (Eds.). (1992). *UK hotel groups directory* (4th ed.). London: Cassell.

Heras-Saizarbitoria, I., Arana, L. G., & Molina-Azorín, J. F. (2011). Do drivers matter for the benefits of ISO 14001? *International Journal of Operations & Production Management*, *31*(2), 192-216. doi:10.1108/01443571111104764

Hildebrand, J. L. (1970). Noise pollution: An introduction to the problem and an outline for future legal research. *Columbia Law Review*, *70*(4), 652-692. doi:10.2307/1121310

Hillary, R. (2004). Environmental management systems and the smaller enterprise. *Journal of Cleaner Production*, *12*(6), 561-569. doi:10.1016/j.jclepro.2003.08.006

Hoffman, D. M. (2009). Multiple methods, communicative preferences and the incremental interview approach protocol. *Forum: Qualitative Social Research*, *10*(1), 1-19.

Hoornweg, D., & Bhada-Tata, P. (2012). *What a waste: A global review of solid waste management*. Washington, DC: World Bank.

Hsieh, Y. C. (2012). Hotel companies' environmental policies and practices: A content analysis of their web pages. *International Journal of Contemporary Hospitality Management*, *24*(1), 97-121. doi:10.1108/095961112

Huberman, A. M., & Miles, M. B. (1994). Data management and analysis methods. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 428-444). Thousand Oaks, CA: Sage.

Ichinose, D., Higashida, K., Shinkuma, T., & Kojima, M. (2013). Should the trade of hazardous waste be uniformly regulated? An empirical analysis of export demand for 'waste and scrap'. *Environment and Development Economics*, *18*(06), 773-793. doi:10.1017/s1355770x13000302

International Hotel Environmental Initiative. (2002). *Hotels care: Community action and responsibility for the environment*. London: Author. Retrieved from http://www.reefball.com/map/fourseasons/HotelsCare.pdf

Indrayana, E., & Silas, J. (1993). Waste management in Surabaya: A partnership approach. *Regional Development Dialogue*, *14*(3), 51-66.

Italian National Agency for the Protection of the Environment and for Technical Services. (2002). Tourists accommodation EU eco-label award scheme (Final report). Retrieved from http://www.isprambiente.gov.it/contentfiles /01378500/1378595-touristaccomodation-finalreport.pdf/at_download/file

Jaafar, M., Rashid Abdul Aziz, A., & Zaleha Mohd Sukarno, S. (2012). Tourism marketing: An overview of small and medium budget hotels (SMBHs). *Asia Pacific Journal of Tourism Research*, *17*(1), 1-13. doi:10.1080/10941665.2011.63210

Jaruwan Kasemtrap. (2009). Environmental conservation for sustainable tourism. *Journal Environmental*, *13*(3), 37-41. Retrieved from http://www.eric.chula .ac.th/journal/ej/v13y2552/v13n3y2552/ar7v13n3y2552.pdf

Jones, J. W. (2009). Selection of grounded theory as an appropriate research methodology for a dissertation: One student's perspective. *The Grounded Theory Review*, *8*(2), 23-34.

Jones, P. (2002). The orchid hotel. *Tourism and Hospitality Research*, *3*(3), 277-280. doi:10.1177/146735840200300308

Juran, J. M. (1988). *Juran on planning for quality*. New York: Free Press.

Juran, J. M. (1990). China's ancient history of managing for quality, part II. *Quality Progress*, *23*(August), 25-30.

Karak, T., Bhagat, R. M., & Bhattacharyya, P. (2012). Municipal solid waste generation, composition, and management: The world scenario. *Critical Reviews in Environmental Science and Technology*, *42*(15), 1509-1630. doi:10.1080/10643389.2011.569871

Kasim, A. (2007). Towards a wider adoption of environmental responsibility in the hotel sector. *International Journal of Hospitality & Tourism Administration*, *8*(2), 25-49. doi:10.1300/j149v08n02_02

Kassinis, G. I, & Soteriou, A. C. (2003). Greening the service profit chain: The impact of environmental management practices. *Production and Operations Management, 12*(3), 386-403. doi:10.1111/j.1937-5956.2003.tb00210.x

Kham, M. E., & Manderson, L. (1992). Focus groups in tropical disease research. *Health Policy and Plapning, 7*(1), 56-66. doi:10.1093/heapol/7.1.56

Kharbanda, O. P., & Stallworthy, E. A. (1990). *Waste management: Towards a sustainable society*. New York: Auburm House.

Khemiri, A., & Hassairi, M. (2005). Development of energy efficiency improvement in the Tunisian hotel sector: A case study. *Renewable Energy*, *30*(6), 903-911. doi:10.1016/j.renene.2004.09.021

Kirk, D. (1995). Environmental management in hotels. *International Journal of Contemporary Hospitality Management*, *7*(6), 3-8. doi:10.1108/09596119510095325

Kirk, D. (1998). Attitudes to environmental management held by a group of hotel managers in Edinburgh. *International Journal of Hospitality Management, 17*(1), 33–47. doi:10.1016/s0278-4319(98)00005-x

Knodel. J. (1993). The design and analysis of focus group studies: A practical approach. In D. L. Mogan (Ed.), *Successful focus group: Advancing the state of the art* (pp. 35-50). Newbury Park, CA: Sage.

Kozak, M., & Nield, K. (2004). The role of quality and eco-labelling systems in destination benchmarking. *Journal of Sustainable Tourism*, *12*(2), 138-148. doi:10.1080/09669580408667229

Kozak, M., & Rimmington, M. (1998). Benchmarking: Destination attractiveness and small hospitality business performance. *International Journal of Contemporary Hospitality Management*, *10*(5), 184-188. doi:10.1108/09596119810227767

Krueger, R. A. (1998). *Analyzing and reporting focus group results*. Thousand Oaks, CA: Sage.

Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage.

Lamond, D. (2008). Treading the lines between self-interest, cultural relativism and universal principles: Ethics in the global marketplace. *Management Decision, 46*(8), 1122-1131. doi:10.1108/00251740810901336

LeCompte, M. D., & Schensul, J. J. (1999). *Analyzing and interpreting ethnographic data*. Walnut Creek, CA: Altamira Press.

Lee, P. K. C., To, W. M., &Yu, B. T. W. (2009). The implementation and performance outcomes of ISO 9000 in service organizations. *International Journal of Quality & Reliability Management*, *26*(7), 646-662. doi:10.1108/02656710910975732

Leitmann, J. (1995). A global synthesis of seven urban environmental profiles. *Cities, 12*(1), 23-39. doi:10.1016/0264-2751(95)91863-b

Leonidou, L. C., Leonidou, C. N., Fotiadis, T., & Zeriti, A. (2013). Resources and capabilities as drivers of hotel environmental marketing strategy: Implications for competitive advantage and performance. *Tourism Management*, *35*(April), 94-110. doi:10.1016/j.tourman.2012.06.003

Lewis, B. R., & McCann, P. (2004). Service failure and recovery: Evidence from the hotel industry. *International Journal of Contemporary Hospitality Management, 16*(1), 6-17. doi:10.1108/09596110410516516

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.

Link, S., & Naveh, E. (2006). Standardization and discretion: Does the environmental standard ISO 14001 lead to performance benefits? *IEEE Transactions on Engineering Management, 53*(4), 508-519. doi:10.1109/tem.2006.883704

Lohani, B. N. (1988). Solid waste management in hot climate: lssues, constraints, problems and management strategies in developing countries in Asia. ln L. Andersen & J. Moller (Eds.), *ISWA 88 Proceedings of the 5th International Solid Wastes Conference, Volume I, Copenhagen, Denmark, September 11-16th, 1988* (pp. 393-408). London: Academic.

LosAnwe, I. (2013). *Environmentally friendly luxury hotel case: Grand Palace Hotel, Riga, Latvia* (Umpublished master's thesis), Lahti University of Applied Sciences, Latvia.

Louis, G. E. (2004). A historical context of municipal solid waste management in the United States. *Waste Management & Research, 22*(4), 306-322. doi:10.1177/0734242x04045425

Mack, N., Woodsong, C., MacQueen, K.M., Guest, G., & Namey, E. (2005). *Qualitative research methods: A data collector's field guide*. Research Triangle Park, NC: Family Health International. Retrieved from https://www.fhi360.org/sites/default/files/media/documents/Qualitative%20Research%20Methods%20-%20A%20Data%20Collector%27s%20Field%20Guide.pdf

Main, H., Chung, M., & Ingold, A. (1997). A preliminary study of data utilization by small to medium-sized hotels. *International Journal of Contemporary Hospitality Management, 9*(2/3), 92-96.

Majid, M. R. (2007). *Sustainable solid waste management for Island resorts: Potential for Perhentian Island, Terengganu*. Presented at the 1st International Conference on Built Environment in Developing Countries (ICBEDC 2007), Pulau Pinang, Malaysia.

Maniatis, K., Vanhille, S., Martawijaya, A., Buekens, A., & Verstraete, W. (1987). Solid waste management in Indonesia: Status and potential. *Resources and Conservation, 15*(4), 277-290. doi:10.1016/0166-3097(87)90075-7

Marion, J. (2000). Composting 12,000 tons of food residuals a year. *BioCycle, 41*(5), 30-35.

Marshall, C., & Rossman, G. B. (1995). *Designing qualitative research* (2nd ed.). Thousand Oaks, CA: Sage.

Masau, P., & Prideaux, B. (2003). Sustainable tourism: A role for Kenya's hotel industry. *Current Issues in Tourism, 6*(3), 197-208. doi:10.1080/13683500308667953

Massoud, M. A., Fayad, R., El-Fadel, M., & Kamleh, R. (2010). Drivers, barriers and incentives to implementing environmental management systems in the food industry: A case of Lebanon. *Journal of Cleaner Production, 18*(3), 200-209. doi:10.1016/j.jclepro.2009.09.022

Maxwell, B. (1996). Translation and cultural adaptation of the survey instruments. In Michael O. Martin & Dana L. Kelly (Eds.), *Third international mathematics and science study (TIMSS) technical report, volume 1 design and development* (pp. 159-169). Chestnut Hill, MA: International Association for the Evaluation of Educational Achievement (IEA). Retrieved from http://files.eric.ed.gov/fulltext/ED406418. pdf#page=159

Mbaiwa, J. E. (2011). Hotel companies, poverty and sustainable tourism in the Okavango Delta, Botswana. *World Journal of Entrepreneurship, Management and Sustainable Development*, *7*(1), 47-58. doi:10.1108/20425961201000030

Medina, M. (1993). Collecting recyclables in Metro Manila. *BioCycle, 34*(6), 51-53.

Melnyk, S. A., Sroufe, R. P., & Calantone, R. (2003). Assessing the impact of environmental management systems on corporate and environmental performance. *Journal of Operations Management*, *21*(3), 329-351. doi:10.1016/s0272-6963(02)00109-2

Menand, L. (2001). *The metaphysical club: A story of ideas in America.* New York: Farrar, Straus, and Giroux.

Merriam, S. B. (2002). *Qualitative research in practice examples for diacussion and analysis*. San Francisco, CA: Jossey-Bass.

Mezher, T., & Zreik, C. (2000). Current environmental management practices in the Lebanese manufacturing sector. *Eco-Management and Auditing, 7*(3), 131-142. doi:10.1002/1099-0925(200009)7:3<131::AID-EMA134>3.0.CO;2-C

Midwall, J., Ambrose, J., Pichard, A., Abedin, Z., & Herman, M. V. (1982). Angina pectoris before and after myocardial infarction. Angiographic correlations. *Chest, 81*(6), 681-686. doi:10.1378/chest.81.6.681

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.

Min, H., & Galle, W. P. (1997). Green purchasing strategies: Trends and implications. *International Journal of Purchasing and Materials Management, 33*(2), 10-17. doi:10.1111/j.1745-493x.1997.tb00026.x

Misra, L. I. (2014). TQM Practices in hospitality and tourism sector in India. *International Journal of Applied Services Marketing Perspectives, 3*(4), 1317-1324.

Moen, R. D., & Norman, C. L. (2010). Circling back: Clearing up myths about the Deming cycle and seeing how it keeps evolving. *Quality Progress, 43*(11), 22–28.

Molina-Azorín, J. F., Claver-Cortés, E., Pereira-Moliner, J., & Tarí, J. J. (2009). Environmental practices and firm performance: An empirical analysis in the Spanish hotel industry. *Journal of Cleaner Production, 17*(5), 516-524. doi:10.1016/j.jclepro.2008.09.001

Moore, M., Gould, P., & Keary, B. S. (2003). Global urbanization and impact on health. *International Journal of Hygiene and Environmental Health, 206*(4), 269-278. doi:10.1078/1438-4639-00223

Morgan, D. L. (1997). *Focus groups as qualitative research* (2nd ed.). Thousand Oaks: Sage.

Morgera, E., & Durán, G. M. (2006). The 2005 UN world summit, the environment and the role of the EU: Priorities, promises and prospects. *Review of European Community & International Environmental Law, 15*(1), 11-22. doi:10.1111/j.1467-9388.2006.00510.x

Mori, S., & Van Zijl, P. C. M. (2002). Fiber tracking: Principles and strategies-a technical review. *NMR in Biomedicine, 15*(7-8), 468-480. doi:10.1002/nbm.781

Morris, J. R., Phillips, P. S., & Read, A. D. (2000). Developments: The UK Landfill Tax: Financial Implications for Local Authorities. *Public Money and Management, 20*(3), 51-54. doi:10.1111/1467-9302.00224

Morrison, A. (1998). Small firm statistics: A hotel sector focus. *The Service Industries Journal, 18*(1), 132-142. doi:10.1080/02642069800000008

Morrison, A., & Conway, F. (2007). The status of the small hotel firm. *The Service Industries Journal, 27*(1), 47-58. doi:10.1080/02642060601038643

Morrison, A., & Teixeira, R. (2004). Small business performance: A tourism sector focus. *Journal of Small Business and Enterprise Development, 11*(2), 166-173. doi:10.1108/ 14626000410537100

Morrison, A. J., & King, B. E. M. (2002). Small tourism businesses and e-commerce: Victorian tourism online. *Tourism and Hospitality Research, 4*(2), 104-115. doi:10.1177/146735840200400202

Mostafa, M. M. (2007). Gender differences in Egyptian consumers' green purchase behaviour: The effects of environmental knowledge, concern and attitude. *International Journal of Consumer Studies, 31*(3), 220-229. doi:10.1111/j.1470-6431.2006.00523.x

Mulcahy, M., Evans, D. S., Hammond, S. K., Repace, J. L., & Byrne, M. (2005). Secondhand smoke exposure and risk following the Irish smoking ban: An assessment of salivary cotinine concentrations in hotel workers and air nicotine levels in bars. *Tobacco Control, 14*(6), 384-388. doi:10.1136/tc.2005.011635

Murray, R. (1999). *Creating wealth from waste*. London: Demos.

Muttamara, S., Visvanathan, C., & Alwis, K. U. (1994). Solid waste recycling and reuse in Bangkok. *Waste Management & Research, 12*(2), 151-163. doi:10.1177/0734242x9401200205

Nair, K. N., & Sridhar, R. S. (Eds.). (2005). *Cleaning up Kerala: Studies in self-help in dealing with solid waste* (Vol. 1). Delhi: Daanish Books.

Nakasima, K., Kojima, M., & Gupta, S. M. (2012). Management of a disassembly line using two types of kanbans. *International Journal of Supply Chain Management, 1*(3), 11-19.

Neumayer, E., & Perkins, R. (2005). Uneven geographies of organizational practice: Explaining the cross-national transfer and diffusion of ISO 9000. *Economic Geography, 81*(3), 237-259. doi:10.1111/j.1944-8287.2005.tb00269.x

Ng, L. C., Musser, A., Persily, A. K., & Emmerich, S. J. (2012). Indoor air quality analyses of commercial reference buildings. *Building and Environment, 58*(December), 179-187. doi:10.1016/j.buildenv.2012.07.008

Nielsen, B. and Green Restaurant Association. (2004). *Dining green: A guide to creating environmentally sustainable restaurants and kitchens*. Sharon, MA: Author.

Nzeadibe, T. C. (2009). Solid waste reforms and informal recycling in Enugu urban area, Nigeria. *Habitat International*, *33*(1), 93-99. doi:10.1016/j.habitatint.2008.05.006

Ogawa, H. (1989). Selection of appropriate technology for solid waste management in Asian metropolises. *Regional Development Dialogue, 10*(3), 68-87.

Ortlipp, M. (2008). Keeping and using reflective journals in the qualitative research process. *The Qualitative Report*, *13*(4), 695-705.

Ouano, E. A. R. (1993). Imperatives for recycling and resource recovery. *Regional Development Dialogue, 14*(3), 25-39.

Padungsirikul, P. (2003). *Sustainable solid waste landfill management research and development in Thailand*. Bangkok: Pollution Control Department of Thailand.

Parfitt, J., Barthel, M., & Macnaughton, S. (2010). Food waste within food supply chains: Quantification and potential for change to 2050. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *365*(1554), 3065-3081. doi:10.1098/rstb.2010.0126

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.

Pereira-Moliner, J., Claver-Cortés, E., Molina-Azorín, J. F., & Joss Tari, J. (2012). Quality management, environmental management and firm performance: Direct and mediating effects in the hotel industry. *Journal of Cleaner Production*, *37*(December), 82-92. doi:10.1016/j.jclepro.2012.06.010

Phillips, P. A. (1999). Hotel performance and competitive advantage: A contingency approach. *International Journal of Contemporary Hospitality Management*, *11*(7), 359-365. doi:10.1108/09596119910293268

Pine, R. (2002). China's hotel industry: Serving a massive market. *The Cornell Hotel and Restaurant Administration Quarterly, 43*(3), 61-70. doi:10.1016/S0010-8804(02)80019-2

Pirani, S. I., & Arafat, H. A. (2014). Solid waste management in the hospitality industry: A review. *Journal of Environmental Management, 146*(15), 320-336. doi:10.1016/j.jenvman.2014.07.038

Pivcevic, S. (2009). Strategic networks of small hotels-Evidence from Croatia. *Tourism and Hospitality Management, 15*(2), 163–175.

Platt, B. (2004). *Resources up in flames: The economic pitfalls of incineration versus a zero waste approach in the global south*. Washington, DC: Institute for Loeal Self-Reliance.

Poerbo, H. (1991). Urban solid waste management in Bandung: Towards an integrated resource recovery system. *Environment and Urbanization, 3*(1), 60-69. doi:10.1177/095624789100300106

Poksinska, B., Jorn Dahlgaard, J., & Eklund, J. A. E. (2003). Implementing ISO 14000 in Sweden: Motives, benefits and comparisons with ISO 9000. *International Journal of Quality & Reliability Management, 20*(5), 585-606. doi:10.1108/02656710310476543

Punch, K. (2000). *Developing effective research proposals*. London: Sage.

Rada, J. (1996). Designing and building eco-efficient hotels. *Green Hotelier, 4*, 10-11.

Radisson SAS. (2003*). Responsible business report 2002*. Brussels, Belgium: Radisson SAS Hotels & Resorts.

Radwan, H. R. I., Jones, E., & Minoli, D. (2010). Managing solid waste in small hotels. *Journal of Sustainable Tourism*, *18*(2), 175-190. doi:10.1080/09669580903373946

Radwan, H. R. I., Jones, E. & Minoli, D. (2012). Solid waste management in small hotels: a comparison of green and non-green small hotels in Wales. *Journal of Sustainable Tourism, 20*(4), 533-550. doi:10.1080/09669582.2011.621539

Rahman, I., Reynolds, D., & Svaren, S. (2012). How "green" are North American hotels? An exploration of low-cost adoption practices. *International Journal of Hospitality Management, 31*(3), 720-727. doi:10.1016/j.ijhm.2011.09.008

Revilla, G., Dodd, T. H., & Hoover, L. C. (2001). Environmental tactics used by hotel companies in Mexico. *International Journal of Hospitality & Tourism Administration, 1*(3-4), 111-127. doi:10.1300/j149v01n03_07

Robinot, E., & Giannelloni, J. -L. (2010). Do hotels "green" attributes contribute to customer satisfaction? *Journal of Services Marketing, 24*(2), 157-169.

Robson, C. (2002). *Real world research: A resource for soeial scientisys and paraetitioner-researcher* (2nd ed.). Malden, MA: Blackwell.

Rondinelli, D., & Vastag, G. (2000). Panacea, common sense, or just a label?: The value of ISO 14001 environmental management systems. *European Management Journal, 18*(5), 499-510. doi:10.1016/s0263-2373(00)00039-6

Roy, M. J., Boiral, O., & Lagace, D. (2001). Environmental commitment and manufacturing excellence: A comparative study within Canadian industry. *Business Strategy and the Environment, 10*(5), 257-268. doi:10.1002/bse.304

Rubin, H. J., & Rubin, I. S. (2012). *Qualitative interviewing: The art of hearing data* (3rd ed.). Thousand Oaks, CA: Sage.

Runyan, R. C. (2006). Small businesses in the face of crisis: Identifying barriers to recovery from a natural disaster. *Journal of Contingencies and Crisis Management, 14*(1), 12–26. doi:10.1111/j1468-5973.2006.00477.x

Ryan, F., Coughlan, M., & Cronin, P. (2009). Interviewing in qualitative research: The one-to-one interview. *International Journal of Therapy & Rehabilitation, 16*(6), 309-314. doi:10.12968/ijtr.2009.16.6.42433

Sarkis, J., & Dijkshoorn, J. (2007). Relationships between solid waste management performance and environmental practice adoption in Welsh small and medium-sized enterprises (SMEs). *International Journal of Production Research, 45*(21), 4989-5015. doi:10.1080/00207540600690529

Seigneur, C., Pun, B., Pai, P., Louis, J. -F., Solomon, P., Emery, C., ... Tombach, I. (2000). Guidance for the performance evaluation of three-dimensional air quality modeling systems for particulate matter and visibility. *Journal of the Air & Waste Management Association, 50*(4), 588-599. doi:10.1080/10473289.2000.10464036

Shanklin, J., & Somerville, C. (1991). Stearoyl-acyl-carrier-protein desaturase from higher plants is structurally unrelated to the animal and fungal homologs. *Proceedings of the National Academy of Sciences, 88*(6), 2510-2514. doi:10.1073/pnass.88.6.2510

Shen, L. Y., & Tam, V. W. Y. (2002). Implementation of environmental management in the Hong Kong construction industry. *International Journal of Project Management, 20*(7), 535-543. doi:10.1016/s0263-7863(01)00054-0

Sila, I., & Ebrahimpour, M. (2005). Critical linkages among TQM factors and business results. *International Journal of Operations & Production Management, 25*(11), 1123-1155. doi:10.1108/01443570510626925

Silvennoinen, K., Katajajuuri, J. M., Hartikainen, H., Jalkanen, L., Koivupuro, H. K., & Reinikainen, A. (2012). Food waste volume and composition in the finish supply chain: Special focus on food service sector. *Proceedings Venice 2012, Fourth International Symposium on Energy from Biomass and Waste Cini Foundation,* Venice, Italy, November 12-15, 2012. Italy: CISA. Retrieved from https://portal.mtt.fi/portal/page/portal/mtt/hankkeet/foodspill /Food%20Waste%20Volume%20and%20Composition%20Focus%20on%20Food%20Service%20Sector.pdf

Simpson, A. & Barker, P. (2007). The persistence of memory: Using narrative picturing to co-operatively explore life stories in qualitative inquiry. *Nursing Inquiry, 14*(1), 35-41. doi:10.1111/j.1440-1800.2007.00350.x

Singh, V. K. (2013). PDCA cycle: A quality approach. *Utthan–The Journal of Management Sciences, 1*(1), 89-96.

Smith, C. A., Farrah, T., & Goodwin, R. G. (1994). The TNF receptor superfamily of cellular and viral proteins: Activation, costimulation, and death. *Cell, 76*(6), 959-962. doi:10.1016/0092-8674(94)90372-7

Snarr, J., & Pezza, K. (2000). *Recycling guidebook for the hospitality and restaurant industry*. Washington, DC: Information Centre, Metropolitan Washington Council of Governments.

Stak, R. E. (2000). Case studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp.435-454). Thousand Oaks, CA: Sage.

Stanworth, J., & Gray, C. (1991). Employment and employment relations in the small enterprise In J. Stanworth & C. Gray (Eds.), *Bolton 20 years on: The small firm in the 1990s* (pp. 192–208). London: Paul Chapman.

Steckley, M., & Doberstein, B. (2010). Tsunami survivors' perspectives on vulnerability and vulnerability reduction: Evidence from Koh Phi Phi Don and Khao Lak, Thailand. *Disasters, 35*(3), 465-487. doi:10.1111/j.1467-7717.2010.01221.x

Stenmarck, A., Jorgen Hanssen, O., Silvennoinen, K., Katajajuuri, J. -M., & Werge, M. (2011). *Initiatives on prevention of food waste in the retail and wholesale trades*. Copenhagen, Denmark: Nordic Council of Ministers.

Stenzel, P. L. (2000). Can the ISO 14000 series environmental management standards provide a viable alternative to government regulation? *American Business Law Journal, 37*(2), 237-298. doi:10.1111/j.1744-1714.2000.tb00272.x

Stewart, D. W., & Shamdasani, P. N. (1990). *Focus Groups: Theory and practice*. Newbury Park, CA: Sage.

Stoller, G. (2005, December 27). Hotel guests can check in, then work out. *USA Today*. Retrieved from http://www.mylaac.com/files/usatoday.pdf

Storey, D. J. (1994). *Understanding the small business sector*. London: Routledge.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research*: *Grounded theory procedures and technigues*. Newbury Park, CA: Sage.

Strauss, A., & Corbin, J. (1994). Grounded theory methodology. An overview. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (pp. 273-285). Thousand Oaks, CA: Sage.

Sugar, L., Kennedy, C., & Hoornweg, D. (2013). Synergies between climate change adaptation and mitigation in development: Case studies of Amman, Jakarta, and Dar es Salaam. *International Journal of Climate Change Strategies and Management, 5*(1), 95-111. doi:10.1108/17568691300299381

Sun, G. -X. (2013). A study on the continuous improvement of hotel service quality based on the PDCA cycle. In Ershi Qi, Jiany Shen & Rumliany Dok (Eds.), *The 19th International Conference on Industrial Engineering and Engineering Management* (pp. 1151-1161). Berlin: Springer. doi:10.1007/978-3-642-38442-4_121

Taylor, S., & Napier, N. K. (2001). An American woman in Turkey: Adventures unexpected and knowledge unplanned. *Human Resource Management, 40*(4), 347-364. doi:10.1002/hrm.1024

Thaman, R. R., Morrison, R. J., Morrell, W. J., & Thaman, B. (2003). *Wasted islands? Waste and the need for integrated waste management in the pacific islands-Current status and prospects for reduction and safe disposal*. Paper for Barbados Plan of action 10 Meeting of Experts on Waste Management in SIDS. Retrieved from http://www.sidsnet.org/docshare/other/20031105164530_WASTED_ISLANDS_-_Draft_Thaman_et_al._for_CD_28.10.03.doc

Thomas, C., Dacombe, P., Maycox, A., Banks, C., Khan, T., & Slater, R. (2007). *Identification of key resource streams in commercial & industrial waste from small businesses in the food sector. Part 1: Main Report and Part 2: Appendices*. Milton Keynes, UK: Integrated Waste Systems Research Group, Open University. Retrieved from http://oro.open.ac.uk/id/eprint/22899

Thomas, R., Shaw, G., & Page, S. J. (2011). Understanding small firms in tourism: A perspective on research trends and challenges. *Tourism Management, 32*(5), 963-976. doi:10.1016/j.tourman.2011.02.003

Townsend, J. M., & Kahn, W. (1991). *Florida's pilot hotel/motel recycling project*. Florida: Florida Department of Environmental Regulation, University of Florida. Retrieved from http://infohouse.p2ric.org/ref/12/11284.pdf

Tran, K. C. (2006). Public perception of development issues: Public awareness can contribute to sustainable development of a small island. *Ocean & Coastal Management, 49*(5), 367-383. doi:10.1016/j.ocecoaman.2006.02.005

Trung, D. N., & Kumar, S. (2005). Resource use and waste management in Vietnam hotel industry. *Journal of Cleaner Production, 13*(2), 109-116. doi:10.1016/j.jclepro.2003.12.014

Tsai, W. -H., Hsu, J. -L., Chen, C. -H., Lin, W. -R., & Chen, S. -P. (2010). An integrated approach for selecting corporate social responsibility programs and costs evaluation in the international tourist hotel. *International Journal of Hospitality Management, 29*(3), 385-396. doi:10.1016/j.ijhm.2009.12.001

Tzschentke, N.A., Kirk, D., & Lynch, P. A. (2004). Reasons for going green in serviced accommodation establishments. *International Journal of Contemporary Hospitality Management, 16*(2), 116-124. doi:10.1108/09596110410520007

Tzschentke, N. A., Kirk, D., & Lynch, P. A. (2008). Going green: Decisional factors in small hospitality operations. *International Journal of Hospitality Management*, *27*(1), 126-133. doi:10.1016/j.ijhm.2007.07.010

Ulin, P. R., Robinson, E. T., Tolley E. E. & McNeill, E. T. (2002). *Qualitative methods in family health: A field guide for applied research*. North Carolina: Wiley.

UN-HABITAT. (2010). *State of the world's cities 2010/2011: Bridging the urban divide*. Nairobi, Kenya: United Nations, Human Settlements Programme. Retrieved from http://unhabitat.org/books/state-of-the-worlds-cities-20102011-cities-for-all-bridging-the-urban-divide/

Van Beukering, P. (1994). An economic analysis of different types of formal and informal entrepreneurs, recovering urban solid waste in Bangalore (India). *Resources, Conservation and Recycling*, *12*(3-4), 229-252. doi:10.1016/0921-3449(94)90011-6

Van De Klundert, A. & Anschutz, J. (2001). Integrated sustainable waste management: The concept. In A. Scheinberg (Ed.), *Tools for decision-makers: Experiences from the Urban Waste Expertise Programme (1995–2001).* Gouda: Urban Waste Expertise Programme.

Van Waning, A. (2010). Waste characterization study. Retrieved from http://www.cityofchicago.org/dam/city/depts/doe/general/RecyclingAndWasteMgmt_PDFs/WasteAndDiversionStudy/WasteCharacterizationReport.pdf

Vila, M., Enz, C., & Costa, G. (2011). Innovative practices in the Spanish hotel industry. *Cornell Hospitality Quarterly, 53*(1), 75-85. doi:10.1177/1938965511426562

Wagh, V. (2008). Management of hotel waste. Retrieved from http://www.karmayog.com/cleanliness/hotelwaste.htm

Walton, M. (1988). *Deming management method*. New York, NY: Penguin.

Wanhill, S. (1990). Tourism statistics. In R. Trare, L. Moutinho, & N. Morgan (Eds.), *Managing and marketing services in the 1990s*. London: Cassell.

Warner, K. E., & Ryall, C. (2001). Greener purchasing activities within UK local authorities. *Eco-Management and Auditing*, *8*(1), 36-45. doi:10.1002/ema.142

Webster, K., Parish, J., Pandya, M., Stern, P. L., Clarke, A. R., & Gaston, K. (2000). The human papillomavirus (HPV) 16 E2 protein induces apoptosis in the absence of other HPV proteins and via a p53-dependent pathway. *Journal of Biological Chemistry*, *275*(1), 87-94. doi:10.1074/jbc.275.1.87

Weng, Y. -C., & Fujiwara, T. (2011). Examining the effectiveness of municipal solid waste management systems: An integrated cost–benefit analysis perspective with a financial cost modeling in Taiwan. *Waste Management*, *31*(6), 1393-1406. doi:10.1016/j.wasman.2011.01.016

Wilson, D. C., Velis, C., & Cheeseman, C. (2006). Role of informal sector recycling in waste management in developing countries. *Habitat International*, *30*(4), 797-808. doi:10.1016/j.habitatint.2005.09.005

Winter, J. P., & Azimi, S. L. (1996). *Less garbage overnight: A waste prevention guide for the lodging industry*. New York: Inform.

Yen, C. -H., Chen, K. -F., Sheu, Y. -T., Lin, C. -C., & Horng, J. -J. (2012). Pollution source investigation and water quality management in the Carp Lake watershed, Taiwan. *CLEAN–Soil, Air, Water*, *40*(1), 24-33. doi:10.1002/elean.201100152

Zaman, A. U. (2014). Measuring waste management performance using the 'Zero Waste Index': The case of Adelaide, Australia. *Journal of Cleaner Production*, *66*(March), 407-419. doi:10.1016/j.jclepro.2013.10.032

Zein, K., Wazner, M. S., Meylan, G. (2008). Best environmental practices for the hotel Industry. Retrieved January 15, 2014 from http://dx.doi.org/10.1016 /j.jenvman.2014.07.038

Zheng, T. (2014). What caused the decrease in RevPAR during the Recession? : An ARIMA with intervention analysis of room supply and market demand. *International Journal of Contemporary Hospitality Management*, *26*(8), 1225-1242. doi:10.1108/ijchm-05-2013-0192

Zikmund, W. G. (2003). *Business research methods* (7th ed.). Mason, OH: Thomson/ South-Western.

Zurbrugg, C. (2002). *Urban solid waste management in low-income countries of Asia how to cope with the garbage crisis.* Presented for: Scientific Committee on Problems of the Environment (SCOPE), Urban Solid Waste Management Review Session, Durban. Retrieved from http://www.eawag.ch/fileadmin/Domain1/Abteilungen/sandec/publikationen/SWM/General_Overview/Zurbruegg_2003_Crisis.pdf

APPENDICES

Appendix A

Request Interview

A.1 Document Request interview

A.2 The document invites a small group discussion.

ที่ ศธ ๐๕๒๖.๑๖/๑๕๖

คณะการจัดการการท่องเที่ยว
สถาบันบัณฑิตพัฒนบริหารศาสตร์
๑๑๘ ถนนเสรีไทย คลองจั่น บางกะปิ
กทม ๑๐๒๔๐

๑๐ เมษายน ๒๕๕๗

เรื่อง ขออนุญาตสัมภาษณ์
เรียน ผู้ประกอบการโรงแรม

ด้วย นายชูศักดิ์ ชูศรี รหัสนักศึกษา ๕๕๒๑๙๓๑๐๑๔ นักศึกษาหลักสูตรปรัชญาดุษฎีบัณฑิต สาขาวิชาการจัดการการท่องเที่ยวแบบบูรณาการ คณะการจัดการการท่องเที่ยว สถาบันบัณฑิตพัฒนบริหารศาสตร์ (นิด้า) ทำการศึกษาดุษฎีนิพนธ์เรื่อง **"การจัดการโรงแรมขนาดเล็กเพื่อสร้างความเป็นมิตรกับสิ่งแวดล้อมในด้านการจัดการขยะ : กรณีศึกษากลุ่มจังหวัดภาคใต้ฝั่งอ่าวไทย** (Small Hotel Best Practice for Environmental Friendly Management, focusing on Waste Management A Case Study from the Southern Gulf of Thailand) โดยมีอาจารย์ ดร.สุวารี นามวงค์ เป็นอาจารย์ที่ปรึกษา ซึ่งจำเป็นจะต้องเก็บข้อมูลโดยมีผู้เกี่ยวข้องในการจัดการโรงแรมเป็นกลุ่มเป้าหมาย ในการให้ข้อมูลเชิงคุณภาพผ่านการสัมภาษณ์เชิงลึกรายบุคคลในประเด็นการจัดการขยะของโรงแรม

ดังนั้นเพื่อให้การศึกษาดุษฎีนิพนธ์บรรลุตามเป้าหมายจึงขอความอนุเคราะห์จากท่านอนุญาตให้นักศึกษาทำการสัมภาษณ์ในประเด็นดังกล่าว

จึงเรียนมาเพื่อโปรดพิจารณาอนุเคราะห์จากท่าน จักขอบพระคุณยิ่ง

ขอแสดงความนับถือ

(รองศาสตราจารย์ ดร.เทิดชาย ช่วยบำรุง)
คณบดี

สำนักเลขานุการคณะฯ
โทร (๐๒) ๗๒๗ ๓๖๗๑-๓
โทรสาร (๐๒) ๓๗๕ ๔๒๒๒
ติดต่อนักศึกษา ๐๘๑ ๘๙๒๕๕๕๐ อีเมล์ krutae@hotmail.com

ผู้ร่วมประชุมกลุ่ม เรื่อง รูปแบบการจัดการขยะต้นทางของโรงแรมขนาดเล็ก
: กรณีศึกษาภาคใต้ฝั่งอ่าวไทย
ณ โรงแรม world Resort วันที่ 21 มีนาคม 2558

ลำดับ	ชื่อ-สกุล	ตำแหน่ง	ลายเซ็น
1	คุณเรืองนาม ไชกว้าง	นายกสมาคมโรงแรมไทยภาคใต้ฝั่งตะวันออก	
2		ตัวแทนนายกเทศมนตรีนครเกาะสมุย	
3	คุณนิมิต ผลผลา	รักษาราชการในตำแหน่งผู้อำนวยการโรงเรียนวัดบุญหริการาม/ผู้ประกอบการโรงแรมกีรติ รีสอร์ท	
4	คุณอาภา สามสุวรรณ	ผู้ประกอบการโรงแรมพี เอส ธนา รีสอร์ท	
5	คุณสุกิญญา ศรีทองกุล	ที่ปรึกษานายกเทศมนตรีเทศบาลนครเกาะสมุย/ผู้ประกอบการโรงแรม World Resort	
6	คุณจิราพรรณ คีอกเลี่ยม	วิทยฐานะครูชำนาญการ(ค.ศ๒)โรงเรียนวัดภูเขาทอง/ผู้ประกอบการโรงแรม ณ ภัทร การ์เด้นโฮม	
7	คุณสุกฤษฎ์ เจริญรัตน์	ผู้ประกอบการโรงแรม Florist Resort Koh Samui	
8	คุณดวงพร แย้มพัน	ผู้ประกอบการโรงแรม Lolita Bungalow	
9	ศรินโรจน์ นาวัลย์	ผู้ประกอบการโรงแรม [illegible]	

Appendix B

Interview

B.1 Interviews with owners/managers of small hotels.

B.2 Performance Evaluation model of Zero waste management a small hotel.

บันทึกการสัมภาษณ์ที่ … … …

แบบสัมภาษณ์ รูปแบบการจัดขยะฐานศูนย์ของโรงแรมขนาดเล็ก; กรณีศึกษาภาคใต้ฝั่งอ่าวไทย

>> >>

คำชี้แจง เจ้าของ/ผู้จัดการโรงแรม/ผู้มีส่วนเกี่ยวข้องกับการจัดการขยะของโรงแรม

กระผม นายชูศักดิ์ ชูศรี นักศึกษาปรัชญาดุษฎีบัณฑิต คณะการจัดการท่องเที่ยว สถาบันบัณฑิตพัฒนบริหารศาสตร์ (นิด้า) ทำการการศึกษาวิจัยเรื่อง “รูปแบบการจัดการขยะฐานศูนย์ของโรงแรมขนาดเล็ก กรณีศึกษาภาคใต้ฝั่งอ่าวไทย” และมีการสัมภาษณ์เป็นการพูดคุยเพื่อเก็บข้อมูลเชิงคุณภาพเป็นส่วนสำคัญในการศึกษากล่าวถึงส่วนที่สำคัญอยู่ 2 ประการ คือ ประการแรกอะไรคือปัจจัยที่มีส่วนช่วยในการจัดการขยะฐานศูนย์ของโรงแรมขนาดเล็ก ประการที่สองขั้นตอนในการจัดการขยะต้นทางทางของโรงแรมขนาดเล็กเป็นอย่างไร

ข้อมูลการสัมภาษณ์ครั้งนี้จะถูกนำไปใช้ในการวิจัยครั้งนี้เท่านั้น ข้อมูลส่วนบุคคลของท่านจะถูกเก็บรักษาในฐานข้อมูลเป็นอย่างดีโดย นายชูศักดิ์ ชูศรี และทำการทำลายข้อมูลทั้งหมดภายใน 2 ปี การให้ข้อมูลของท่านในครั้งนี้เป็นการให้สัมภาษณ์ด้วยความสมัครใจ และผู้วิจัยขออนุญาตบันทึกภาพและบันทึกเสียงด้วย

ขออภัยที่ทำให้ท่านเสียเวลาในการให้ข้อมูลจากการสัมภาษณ์ในครั้งนี้ หวังว่าผลของการศึกษาวิจัยครั้งนี้คงได้ช่วยพัฒนาทางโรงแรมของท่านในโอกาสต่อไป ทั้งนี้หากท่านมีข้อสงสัยประการใดเกี่ยวกับการสัมภาษณ์สามารถติดต่อผู้วิจัยโดยตรงที่ โทร 081-892-5550 อีเมล์ kruta47@hotmail.com

ขอขอบพระคุณท่านเป็นอย่างสูงที่ให้ความร่วมมือ

ชูศักดิ์ ชูศรี

บันทึกการสัมภาษณ์ที่ ... ...

1. คำถามการวิจัยที่ 1 อะไรคือปัจจัยที่มีส่วนในการจัดการขยะของโรงแรมขนาดเล็กมีอะไรบ้าง ?

ข้อที่ 1.1 สถาพที่ตั้งของโรงแรมมีส่วนช่วยในการจัดการขยะอย่างไรบ้าง
ข้อที่ 1.2 มีวิธีการใดบ้างที่มีส่วนช่วยในการจัดการขยะ
ข้อที่ 1.3 ค่าใช้จ่ายในการจัดการขยะมีส่วนช่วยในการจัดการขยะอย่างไรบ้าง
ข้อที่ 1.4 กฎระเบียบในโรงแรมอะไรบ้างมีส่วนช่วยในการจัดการขยะ
ข้อที่ 1.5 เจ้าของ/ผู้บริหารโรงแรมมีส่วนช่วยในการจัดการขยะอย่างไรบ้าง
ข้อที่ 1.6 ความร่วมมือของพนักงานมีส่วนช่วยในการจัดการขยะอย่างไรบ้าง
ข้อที่ 1.7 ลูกค้ามีส่วนช่วยในการจัดการขยะอย่างไรบ้าง

2. คำถามการวิจัยที่ 2 อะไรคือขั้นตอนการจัดการขยะฐานศูนย์ของโรงแรมขนาดเล็กที่มีอยู่ปัจจุบัน ?

ข้อที่ 2 ทางโรงแรมมีนโยบายการวางแผนด้านการจัดการขยะฐานศูนย์อย่างไร ?

- มีแผนการปฏิบัติการอย่างไร
- มีวัตถุประสงค์และเป้าหมายอย่างไร

ข้อที่ 3.1 ขยะที่เกิดขึ้นในโรงแรมมีประเภทอะไรบ้าง ?

- ขยะเศษอาหาร
- ขยะที่นำกลับมาใช้ใหม่
- ขยะนำกลับมา ใช้ไม่ได้
- ขยะพิษ
- ขยะเศษวัสดุ

ข้อที่ 3.2 ทางโรงแรมมีการป้องกันการเกิดขยะ (Reduce) อย่างไรบ้าง ?
ข้อที่ 3.3 ทางโรงแรมมีการคัดแยกขยะออกเป็น 5 ประเภท ขยะเศษอาหาร, ขยะที่นำกลับมาใช้ใหม่, ขยะที่นำกลับมาใช้ไม่ได้ ขยะพิษ และขยะเศษวัสดุ อย่างไรบ้าง ?
ข้อที่ 3.4 ทางโรงแรมมีการนำขยะมาใช้ประโยชน์ใหม่อีกครั้ง (Reuse) อย่างไรบ้าง ?
ข้อที่ 3.5 ทางโรงแรมมีการใช้ประโยชน์จากคุณสมบัติเฉพาะตัวของขยะนั้นๆ (Recovery) อย่างงไรบ้าง ?
ข้อที่ 3.6 ทางโรงแรมมีการนำขยะมาดัดแปลงเพื่อใช้ประโยชน์ (Recycle)อย่างไรบ้าง
ข้อที่ 4 ทางโรงแรมมีการตรวจสอบ/ควบคุมการดำเนินงานการจัดการขยะอย่างไรบ้าง
ข้อที่ 5 ทางโรงแรมมีการดำเนินการปรับปรุงการดำเนินการให้ดีขึ้นอย่างไรบ้าง

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แสดงแบบประเมินประสิทธิภาพของ รูปแบบการจัดการขยะฐานศูนย์ของโรงแรมขนาดเล็ก

ประเด็นพิจารณา	ผลการประเมิน		หมายเหตุ
	เห็นด้วย	ไม่เห็นด้วย	
ปัจจัยที่มีส่วนในการจัดการขยะของ โรงแรมขนาดเล็ก			
ข้อที่ 1.1 ความร่วมมือของพนักงานในการจัดการขยะ			
ข้อที่ 1.2 วิธีการมีส่วนช่วยในการจัดการขยะ			
ข้อที่ 1.3 เจ้าของ/ผู้บริหารโรงแรม มีส่วนช่วย ในการจัดการขยะ			
ข้อที่ 1.4 กฎระเบียบในโรงแรมมีส่วนช่วยใน การจัดการขยะ			
ข้อที่ 1.5 ค่าใช้จ่ายในการจัดการขยะมีส่วนช่วยใน การจัดการขยะ			
ข้อที่ 1.6 สถาพที่ตั้งของโรงแรมมีส่วนช่วยใน การจัดการขยะ			
ข้อที่ 1.7 ลูกค้ามีส่วนช่วยในการจัดการขยะ			
ขั้นตอนการจัดการขยะต้นทางของโรงแรมขนาดเล็กที่มีอยู่ปัจจุบัน			
ข้อที่ 2 ทางโรงแรมมีนโยบายการวางแผนด้าน การจัดการขยะฐานศูนย์			
ข้อที่ 2.1 มีแผนการปฏิบัติการ			
ข้อที่ 2.2 มีวัตถุประสงค์และเป้าหมายอย่างไร			
ข้อที่ 3.1 มีการป้องกันการเกิดขยะ(Reduce)			
ข้อที่ 3.2 ขยะที่เกิดขึ้นในโรงแรมมี 4 ประเภท ขยะเศษ อาหาร,ขยะที่นำกลับมาใช้ใหม่,ขยะนำกลับมา ใช้ไม่ได้ ,ขยะพิษ,ขยะเศษวัสดุ			
ข้อที่ 3.3 ทางโรงแรมมีการนำขยะมาใช้ประโยชน์ใหม่ อีกครั้ง (Reuse)			
ข้อที่ 3.4 ทางโรงแรมมีการนำขยะมาดัดแปลงเพื่อ ใช้ประโยชน์ (Recycle)			
ข้อที่ 3.5 ทางโรงแรมมีการใช้ประโยชน์จากคุณสมบัติ เฉพาะตัวของขยะนั้นๆ (Recovery)			
ข้อที่ 4 ทางโรงแรมมีการตรวจสอบ/ควบคุม การดำเนินงานการจัดการขยะอย่างไรบ้าง			
ข้อที่ 5 ทางโรงแรมมีการดำเนินการปรับปรุง การดำเนินการให้ดีขึ้น			

แสดงแบบประเมินประสิทธิภาพของ รูปแบบการจัดการขยะฐานศูนย์ของโรงแรมขนาดเล็ก (ต่อ)

ประเด็นพิจารณา	ผลการประเมิน		หมายเหตุ
	เห็นด้วย	ไม่เห็นด้วย	
รูปแบบการจัดการขยะฐานศูนย์ที่มีผลต่อการบริหารโรงแรมในด้านต่อไปนี้อย่างไรบ้าง Balanced Scorecard (BSC)			
ข้อที่ 6 มุมมองด้านการเงิน			
ข้อที่ 7 มุมมองด้านลุกค้า			
ข้อที่ 8 มุมมองด้านกระบวนการภายใน			
ข้อที่ 9 มุมมองด้านการเรียนรู้			
ข้อที่ 10 มุมมองด้านสิ่งแวดล้อม			

Appendix C

Analysis Result

The priority of the factors that affect the small hotels that cater to the Zero waste management

ลำดับที่	โรงแรม	ปัจจัยที่ส่งเสริมให้เกิดการจัดการขยะฐานศูนย์ของโรงแรม						
		1	2	3	4	5	6	7
1	SWM 1.	✓	✓	✓	✓	✓	✓	
2	SWM 2.	✓	✓	✓	✓	✓	✓	
3	SWM 3.	✓	✓	✓		✓		
4	SWM 4.	✓	✓	✓	✓			✓
5	SWM 5.	✓	✓	✓			✓	
6	SWM 6.	✓	✓	✓	✓		✓	
7	SWM 7.	✓	✓	✓	✓	✓		✓
8	SWM 8.	✓	✓	✓	✓			
9	SWM 9.	✓	✓	✓		✓	✓	
10	SWM 10.	✓	✓	✓	✓	✓		✓
11	SWM 11.	✓	✓		✓		✓	
12	SWM 12.	✓	✓			✓	✓	✓
13	SWM 13.	✓	✓	✓	✓	✓		
14	SWM 14.	✓	✓	✓		✓		
15	SWM 15.	✓	✓	✓	✓			✓
16	SWM 16.	✓	✓	✓	✓	✓		
17	SWM 17.	✓	✓	✓	✓			✓
18	SWM 18.	✓	✓			✓	✓	
19	SWM 19.	✓		✓		✓	✓	✓
20	SWM 20.	✓	✓	✓	✓	✓	✓	
21	SWM 21.	✓	✓	✓	✓			
22	SWM 22.	✓			✓	✓	✓	
23	SWM 23.	✓	✓	✓	✓			
24	SWM 24.	✓	✓	✓	✓	✓	✓	
25	SWM 25.	✓	✓	✓	✓	✓	✓	

The priority of the factors that affect the small hotels that cater to the Zero waste management (Continued)

No.	Small hotels	Factors that promote Zero waste management of the Small hotels.						
		1	2	3	4	5	6	7
26	SWM 26.	✓	✓	✓	✓	✓		✓
27	SWM 27.	✓	✓	✓			✓	
28	SWM 28.	✓	✓	✓	✓	✓	✓	✓
29	SWM 29.	✓	✓	✓	✓	✓	✓	
30	SWM 30.	✓	✓	✓	✓	✓		✓
31	SWM 31.	✓	✓	✓	✓	✓	✓	✓
32	SWM 32.	✓	✓	✓	✓			
33	SWM 33.	✓	✓	✓	✓	✓	✓	✓
34	SWM 34.	✓	✓	✓	✓	✓	✓	
	รวม	**34**	**32**	**30**	**26**	**23**	**19**	**12**

หมายเหตุ: ปัจจัยที่ส่งเสริมให้เกิดการจัดการขยะฐานศูนย์ของโรงแรม ดังนี้

ปัจจัยที่ 1. ความร่วมมือของพนักงานมีส่วนช่วยในการจัดการขยะ

ปัจจัยที่ 2. มีวิธีการที่มีส่วนช่วยในการจัดการขยะ

ปัจจัยที่ 3. เจ้าของ/ผู้บริหารโรงแรม มีส่วนช่วยในการจัดการขยะ

ปัจจัยที่ 4. กฎระเบียบในโรงแรมมีส่วนช่วยในการจัดการขยะ

ปัจจัยที่ 5. ค่าใช้จ่ายในการจัดการขยะมีส่วนช่วยในการจัดการขยะ

ปัจจัยที่ 6. สถาพที่ตั้งของโรงแรมมีส่วนช่วยในการจัดการขยะ

ปัจจัยที่ 7. ลูกค้ามีส่วนช่วยในการจัดการขยะ

Small Hotels for cooperation in data collection

Hotel name	Status of informant	Gender	Age
Koh Pha Ngan			
SWM 1. Phangan Bayshore Resort	Hotel owner	M	42
SWM 2. Ibiza	Hotel owner	W	61
SWM 3. Pen's Bungalow	Hotel owner	W	53
SWM 4. Baan Panburi Resort	Hotel manager	M	42
SWM 5. Haad Yao Bungalow	Hotel employee	M	37
SWM 6. Laid Back Resort	Hotel owner	W	40
SWM 7. SP Resort	Hotel employee	W	59
SWM 8. Haad Yao Over Bay Resort	Hotel manager	W	38
SWM 9. Sea Breeze Bungalow	Hotel owner	M	66
SWM 10. Neptune's Villa	Hotel owner	W	42
SWM 11. Sun Beach Bungalow	Hotel manager	W	39
SWM 12. Phangan Bayshore Resort and Spa	Hotel manager	M	37
SWM 13. Rin Beach Resort	Hotel employee	W	47
SWM 14. Island View Cabana	Hotel owner	M	54
SWM 15. Niramon Villa	Hotel owner	W	55
SWM 16. Rin Bay View	Hotel employee	W	40
SWM 17. Thongsala Guesthouse	Hotel owner	W	67
SWM 18. Grand Sea Resort	Hotel employee	M	53
SWM 19. Phangan Rainbow Bungalows	Hotel manager	W	45
SWM 20. Haad Son Resort	Hotel employee	W	53
Koh Samui			
SWM 26. Serene Hill Resort and Spa	Hotel owner	M	51
SWM 27. Nil Resort	Hotel owner	M	55
SWM 28. Lamai Resort	Hotel manager	W	44
SWM 29. Pavilion Samui Boutique Resort	Hotel owner	W	63
SWM 30. Koh Samui Resort	Hotel owner	W	50
SWM 31. Nora Buri Resort and Spa	Hotel owner	W	40
SWM 32. The White House	Hotel owner	M	62
SWM 33. Kinnaree	Hotel owner	W	64
SWM 34. Baan Chaweng Beach Resort and Spa	Hotel owner	W	53

BIOGRAPHY

NAME	Mr. Choosak Choosri
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	Bachelor of Business Administration **(**Hotel Management**)** Sukhothai Thammathirat Open University
	Bachelor of Business Administration **(**Human Resource Management**)** Valaya Alongkorn Rajabhat University
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