

# COMPLIANCE AND IMPLEMENTATION OF SOLID WASTE MANAGEMENT OF THE BEACH RESORTS IN REGION III

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## Abstract

Waste management is one of the major concerns of beach resorts in Region III. Beach resorts' waste management practices are governed by the level of compliance and implementation mandated by different government agencies. Thus, the main thrust of this study was to determine the level of compliance and implementation of the solid waste management of the various beach resorts in Region III with the end result of developing and enhancing a solid waste management comprehensive development program for beach resorts in Region III. A descriptive research method was utilized in this investigation, employing both quantitative research approaches. A survey was conducted with the participation of one hundred thirty (130) respondents of which one hundred twenty (120) are owners and managers from the sixty (60) beach resorts; one (1) representative of the Department of Environment and National Resources (DENR) from each province and four (4) representatives of Local Government Unit (LGU) agency from selected towns of Bataan and Zambales. In particular, the result of this research indicates that the Compliant Beach Resorts highly implement reduce, reuse and recycle in waste management while the Non-Compliant Beach Resorts slightly implement such practices. The results be a basis in developing and enhancing the implementation of solid waste management for beach resorts in Region III in compliance with the existing laws of the country.

**Keywords:** Waste Management, Beach Resorts, Level of Compliance, Level of Implementation

## 1. INTRODUCTION

Beach is synonymous to modern tourism. This is because the beach as a desirable pleasure space did not become notable until the 19th century, following the defeat of sentiments of danger and strangeness through its gradual reinvention as a coastal resort and playground for pleasure (SAGE International Encyclopedia of Travel and Tourism, 2018).

Central Luzon enjoys certain advantages that present opportunities for developing tourism in as much as Region III is the gateway to Northern Luzon. It becomes a more popular tourist destination for it offers beach resorts. Beaches around the world represent attractive places for holiday tourism and recreational activities. For most people, the presence and good quality of the beach is one of the attractive factors in choosing the holiday or spending quality time with families. On the other hand, beaches and related tourism are promising activities for local economies and they start to show signs of degradation of local environment that can affect ecological status and the recreational experience of people (Choudri et.al. 2016a). The popularization of beach resorts around the globe has contributed to the development of economy and society as a whole. However, several challenges have also surfaced. One of these challenges is the waste management. Tourists may generate up to twice as much solid waste per capita as local residents (IFC, 2016).

Solid waste management remains a serious challenge within the Philippines. Improper waste

disposal, inefficient waste assortment and lack of disposal facilities area units are among the dominant considerations within the country's solid waste management. Unless these areas unit self-addressed, the wastes generated from numerous sources can regularly result in health hazards and high environmental impacts like ground and surface water contamination, flooding, air pollution and spread of diseases. Solid waste management and disposal is a serious matter that requires precise organizational capacity and serious cooperation and involvement from all sectors and stakeholders.

These issues on solid waste management systems are important for beach resort owners to consider in their operation. This prevailing condition prompted the researcher to conduct a study that would basis for developing and enhancing the implementation of solid waste management for beach resorts in Region III. Specifically, this study delved into the level of compliance of beach resorts, and the implementation of waste management.

## **2. OBJECTIVE**

This study aimed to determine the level of compliance and implementation of the waste management of the various beach resorts in Region III to become the basis for developing and enhancing the implementation of solid waste management for beach resorts in Region III for beach resort owners and operators.

## **3. MATERIALS AND METHODS**

### **a. Research Locale**

The respondents of the study came from the beach resorts situated in Central Luzon designated as Region III which is composed of 7 provinces namely: Aurora, Bataan, Bulacan, Nueva Ecija, Pampanga, Tarlac, and Zambales. The researcher decided to conduct the study in Region 3 which focused on the western part of the region where most of the beach resorts are located, specifically Bataan and Zambales. These two provinces are the best-selected locations that have long coastal areas which are also accessible and convenient for the researcher.

### **b. Population and Sampling Technique**

The researcher utilized the purposive sampling technique in choosing the individual respondents. Purposive Sampling is a non-probability sample that is selected based on the characteristics of a population and the objective of the study. Purposive sampling is also known as judgmental, selective, or subjective sampling (Crossman 2017). Also, to collect reliable data, the purposive sampling method was used to select respondents who can give reliable input the level of compliance and implementation of solid waste management among selected beach resorts in Region III.

The first group of respondents consists of one hundred twenty (120) owners and managers from the sixty (60) beach resorts which are compliant and non-compliant from the area of Bataan and Zambales. The compliant resort is a provider of beach resorts that are inclined to agree or obey rules, especially to an excessive degree most especially in solid waste management

compliance, and which 50% comply with the DENR/LGUs requirements as to records, design & operation and given a certification valid for 1 (one) year and the non-compliant is also a provider of beach resort that is not totally applying the proper solid waste management procedure. And which less than 50% complies with the DENR/LGUs requirements as to records, design & operation and given temporary certification valid for 1 (one) year. Another group of respondents consists of one (1) representative of the Department of Environment and National Resources (DENR) from each province and four (4) representatives of the Local Government Unit (LGU) agency from selected towns of Bataan and Zambales where the numerous beach resorts are situated.

The respondents were selected based on the following criteria:

**Set 1: Government Employee**

- Employed in DENR/LGU for a minimum of three (3) years with direct involvement and knowledge in solid waste management or equivalent department in charge to monitor solid waste management of beach resorts. And willing to participate in the study.

**Set 2: Beach Resorts Owners/Managers**

- Employed for a minimum of three (3) years with direct involvement in solid waste monitoring waste management of beach resorts. And willing to participate in the study.

**c. Research Instrumentation**

The study used both quantitative research methods.

**Survey Questionnaire**

The researcher formulated the questionnaire based on readings from books, journals, a thesis/dissertation, and other related materials. Validated survey questionnaires were the main instrument for gathering data in this study and were distributed to the respondents to collect the quantitative data. It was designed to extract information about the beach resorts' level of compliance with records, design and operation. The level of the implementation of waste management to reduce, reuse and recycle was also assessed. It was customized to effectively collect relevant information from managers, owners, and government employees.

There were two sets of questionnaires used. The first set is intended to be answered by the DENR and LGU personnel to gather information about the position and years in service. The questionnaire used to gather the compliance of the selected beach resorts in Bataan and Zambales in terms of records, design and operation. The survey questionnaire was designed based on the Department of Environment and Natural Resources (DENR), Material Recovery Facility (MRF) Monitoring Checklist and Local Government Unit (LGU) to record, design and operation. The second set was intended to be answered by the beach resort owners/managers and LGU/DENR to gather information about positions and years in service. It also includes the questionnaire used to gather the level of implementation of waste management to reduce, reuse, and recycle of the selected beach resorts in Region III. The questionnaire was designed using Philippine environmental laws (Republic Act 9003 Ecological Solid Waste management). In

addition, inputs from employees of LGU, DENR and Beach Resort owners/managers were integrated into the questionnaire.

#### d. Data Gathering Procedure

Quantitatively, the survey was conducted and the questionnaires were distributed to the respondents of the research study after they have given consent to voluntarily participate in this study. Respondents were categorized into two; (1) owners/managers of compliant and non-compliant beach resorts in Bataan and Zambales, (2) DENR/LGU employees who are working in departments that implement environmental policies in each province/municipality.

Prior to the conduct of the study, the researcher asked permission and endorsement from mayors of the concerned municipalities where the beach resorts are situated in Bataan and Zambales. After getting the mayor's approval, the researcher sought permission from the DENR and LGU representatives and managers, and owners of the beach resorts. The researcher personally visited and asked the help from the Local Government Unit of the selected municipalities to administer the questionnaire. The questionnaires were distributed to the respondents and were collected once they have finished accomplishing the instrument. Then, they were retrieved, for beach resort owners/managers, 100% (120 out of 120) were retrieved and were qualified. On the other hand, for DENR/LGU employees, 100% (10 out of 10) were retrieved and qualified.

#### e. Statistical Treatment of Data

The following statistical tools were used in the analysis and interpretation of data:

**Percentage:** This was used to describe the responses of the Compliant and Non-Compliant Beach Resorts on their compliance in terms of records, design, and operation.

**Weighted Mean:** This tool was employed to determine the level of compliance of selected beach resorts to the DENR and LGU requirements, and the level of implementation of solid waste management, in terms of Reduce, Reuse and Recycle.

#### The Four-Point Likert Scale

The following qualitative description including the Likert Scale was adopted to quantify the respondents' responses on each indicator.

**Table 1: The Likert Scale for the Level of Compliance of the selected beach resorts in Region III by the LGUS/DENR requirements**

Mean Percentage Range	Verbal Interpretation
76-100%	Highly Complied (HC)
51-75%	Moderately Complied (MC)
26-50%	Slightly Complied (SC)
0-25%	Not Complied (NC)

**Table 2: The Likert Scale for the Level of Implementation of Solid Waste Management Of Beach Resorts in Region III**

Scale	Range of Mean Value	Verbal Interpretation
4	3.25- 4.00	Highly Implemented (HI)
3	2.50- 3.24	Moderately Implemented (MI)
2	1.75- 2.49	Slightly Implemented (SI)
1	1.00- 1.74	Not Implemented (NI)

**Independent Sample t-Test (t).** This was used to test the significant difference between the mean assessments of the two groups, the compliant and non-compliant on the level of solid waste management implementation as well as on the factors influencing the implementation. The level of significance used was 5%.

#### f. Ethical Consideration

To establish sound and ethical research, the researcher considered various ethical procedures in acquiring, analyzing and accomplishing the data to be gathered.

## 4. RESULTS AND DISCUSSION

### 1. Compliance of Beach Resorts in terms of Records, Design and Operation

**Table 3: Compliance of Beach Resorts in terms of Records, Design and Operation**

Records, Design and Operation		Compliant			Non-Compliant		
		f	%	Decision/ Interpretation	f	%	Decision/ Interpretation
<b>Records</b>							
	The resort maintains proper records of the daily wastes accumulated.	22	73.33	Moderately-Complied	12	40.00	Slightly Complied
<b>Design</b>							
	The resort's building is designed with a proper garbage disposal area.	30	100.00	Highly Complied	21	70.00	Moderately Complied
<b>Operation</b>							
a	The resort uses safe and latest equipment in handling waste products.	18	60.00	Moderately-Complied	8	26.67	Slightly Complied
b	The resort's personnel are well trained to prevent damage of the facility/equipment.	30	100.00	Highly Complied	17	56.67	Moderately-Complied
c	The resort practices the standard operating procedure such as using personal protective wear in daily operation	27	90.00	Highly Complied	23	76.67	Highly Complied
d	The resort applies the	25	83.33	Highly	16	53.33	Moderately-

	proper segregation, composting, and recycling of waste materials.			Complied			Complied
e	The resort transfers wastes to a long-term storage or disposal facility of sanitary landfill.	20	66.67	Moderately-Complied	9	30.00	Slightly Complied
<b>Overall Mean</b>			<b>81.90</b>	<b>Highly Complied</b>		<b>50.47</b>	<b>Slightly Complied</b>

Table 3 exhibits the level of compliance of beach resorts in Bataan and Zambales in terms of records, design and operation.

In terms of Records, the Compliant Beach Resorts display a compliance percentage of 73.33%, which is interpreted as **highly complied**. As to Design, they exhibit a compliance percentage of 100% which is interpreted as **highly complied**. And in terms of Operation, they show a compliance percentage of 100% for “The Resort’s personnel are well trained to prevent damage of the facility/equipment” which is interpreted as **highly complied**, 90% for “The Resort practices the standard operating procedure such as using personal protective wear in daily operation”, which is interpreted as **highly complied**, and 83.33% for “The Resort applies the proper segregation, composting, and recycling of waste materials.”, which is interpreted as **highly complied**. The overall percentage of compliance of Compliant Beach Resorts is 81.90%, which is interpreted as **highly complied**”.

It is interesting to note that the compliant beach resorts practice the requirements given by the DENR/LGUs. This signifies that the beach resorts are compliant with Republic Act 9003 or Municipal Ordinance and with competent and qualified workers also. Also, it is interesting to note the adoption and implementation of R.A. 9003 as a necessary step to proper solid waste management. According to NSWMC, the DENR is the lead government agency responsible for the implementation and enforcement of RA 9003 through the DENR Secretary who chairs the NSWMC. Among the DENR’s roles and responsibilities are the provision of a Secretariat, the establishment of methods and parameters to measure waste collection and disposal, the issuance of rules and regulations to implement the Act, and the issuance of Environmental Compliance Certificates (ECC).he

While for the Non-compliant Beach Resorts, in terms of Records, they got a compliance percentage of 40% for “maintaining proper records of the daily wastes”, which is interpreted as **slightly complied**. In terms of Design, they display a compliance percentage of 70% for “Resort’s building is designed with a proper garbage disposal area”, which is interpreted as **moderately complied**. And in terms of operation, they got a compliance percentage of 76.6% specifically on “The Resort practices the standard operating procedure such as using personal protective wear in daily operation.”, which is interpreted as **moderately complied**, 56.6% for “Resort’s personnel are well trained to prevent damage of the facility/equipment, which is interpreted as **moderately complied**, 53.3% for the “The Resort applies the proper segregation, composting, and recycling of waste materials, which is interpreted as **moderately complied**, 30% for “The Resort transfers wastes to a long term storage or disposal facility of

sanitary landfill, which is interpreted as **slightly complied**, and 26.6% for “Resort uses safe and latest equipment in handling waste products.” which is interpreted as **slightly complied**. The overall percentage of compliance of Compliant Beach resorts is 81.90% with a verbal interpretation of **slightly complied**. The Non-Compliant Beach Resorts practice the standard operating procedure such as using personal protective wear in daily operation. However, the use of safe and latest equipment in handling waste products is not totally exercised. This signifies that the beach resort workers are aware, and knowledgeable and they practice the safety measures to protect them from injuries. However, similar to the results of the complaint beach resorts, they do not have enough solid waste management equipment in handling waste.

This finding supports the study of Ahmadi (2017) that the available best practice especially from developing countries in the areas of policy, institutional setup, financing mechanisms, technology and infrastructure, roles and responsibilities of waste actors, and political will and awareness would quicker the 3R approach improvement method. He further stressed that the improper municipal waste management might lead to serious urban, healthful and environmental issues like unpleasant odor, risk of explosion in lowland areas, and groundwater contamination because of leachate percolation.

## 2. Level of Implementation of the Solid Waste Management

### 2.1 Reduce

**Table 4: Level of Implementation of the Solid Waste Management of Compliant Beach Resorts as Evaluated by the Beach Resort Owners/Managers and LGU/DENR in terms of Reduce**

Reduce		Beach Resort Owners/Managers		LGU	
		Mean	Decision/ Interpretation	Mean	Decision/ Interpretation
a	Patronizing locally or community produced foods to lessen waste materials such as plastics, paper, etc.	3.31	Highly Implemented	3.42	Highly Implemented
b	Applying proper food preparation to reduce wastage.	3.19	Moderately Implemented	3.37	Highly Implemented
c	Using durable furniture.	3.59	Highly Implemented	3.62	Highly Implemented
d	Practicing the standard operating procedures for the repair and maintenance of equipment and properties.	3.57	Highly Implemented	3.65	Highly Implemented
e	Prohibiting littering / throwing in public places, such as roads, sidewalks, canals and water areas.	3.37	Highly Implemented	3.55	Highly Implemented
f	Enforcing proper waste segregation (Biodegradable, Non-Biodegradable and Recyclable).	3.15	Moderately Implemented	3.20	Moderately Implemented
<b>Overall Mean</b>		<b>3.36</b>	<b>Highly Implemented</b>	<b>3.47</b>	<b>Highly Implemented</b>

Table 4 shows the level of implementation of the solid waste management among beach resorts in terms of reduction as assessed by the beach resort owners and managers themselves and LGU personnel.

It can be gleaned from the table the differences in the assessment of the level of implementation in terms of patronizing locally or community produced foods to lessen waste materials such as plastics, paper, etc. (m=3.31, m=3.42), applying proper food preparation to reduce wastage (m=3.19, m=3.37), using durable furniture (m=3.59, m=3.62), practicing the standard operating procedures for the repair and maintenance of equipment and properties (m=3.57, m=3.65), prohibiting littering / throwing in public places, such as roads, sidewalks, canals and water areas (m=3.37, m=3.55), and enforcing proper waste segregation (Biodegradable, Non-Biodegradable and Recyclable) (m=3.37, m=3.55).

There is a very satisfactory agreement between the assessment of the beach resort owners and managers and that of the assessment of the LGU personnel. The Compliant Beach Resorts are classified and branded as “**compliant**” because majority of the standard solid waste management practices in terms of reduce are highly implemented.

In general, beach resort owner’s assessment of their solid waste management implementation displays a weighted average or overall mean of 3.36 and LGU personnel, 3.47, both interpreted as **highly implemented**. Although there is already a high level of implementation of waste management by Compliant Beach Resorts, both the beach resort owners and LGU personnel agree that the implementation of waste management in terms of reduce must further intensify “enforcing proper waste segregation (Biodegradable, Non-Biodegradable and Recyclable)” which obtained a weighted mean of 3.15 by the beach resort owners and managers and 3.20 by the LGU personnel, both corresponding to **moderately implemented**.

According to Nizar et al. (2018), the handling of waste from the beginning of waste avoidance, waste sorting, producer responsibility, waste levies according to the amount of disposal, waste management by the community and the provision of incentives and disincentives is the implementation parameter of Zero Waste. This concept should be integrated into local policy so it becomes an obligation for the government and the community to implement it. A number of cities around the world have implemented Zero Waste policies and set a target to reduce waste disposal to Final Processing Place (TPA) as small as possible. Reducing food waste is a key sustainability challenge for the food service industry. Despite the significance of this issue to the global foodservice industry, the link between innovation practices and food waste management has received limited attention in the academic literature. The uses of innovation management and social constructionism to investigate interrelationships of food service provisions and innovations in waste management are based on the evaluation of food waste solutions and innovations that combine strategic dimensions of waste management with practice-driven initiatives, including incremental (processes and technologies) and radical innovations. The range of waste management initiatives, showing that their implementation in the foodservice sector varies depending on management’s beliefs, knowledge, goals and actions. The concepts discussed could help practitioners to become more aware of the factors that drive the adoption of food waste innovations (Martin-Rios et al., 2018).



**Table 5: Level of Implementation of the Solid Waste Management of Non-Compliant Beach Resorts as Evaluated by the Beach Resort Owners/Managers and LGU/DENR in terms of Reduce**

Reduce		Beach Resort Owners/Managers		LGU	
		Mean	Decision/ Interpretation	Mean	Decision/ Interpretation
a	Patronizing locally or community produced foods to lessen waste materials such as plastics, paper, etc.	2.63	Moderately Implemented	2.42	Slightly Implemented
b	Applying proper food preparation to reduce wastage.	2.31	Slightly Implemented	2.35	Slightly Implemented
c	Using durable furniture.	2.52	Moderately Implemented	2.20	Slightly Implemented
d	Practicing the standard operating procedures for the repair and maintenance of equipment and properties.	2.66	Moderately Implemented	2.42	Slightly Implemented
e	Prohibiting littering / throwing in public places, such as roads, sidewalks, canals and water areas.	2.21	Slightly Implemented	2.25	Slightly Implemented
f	Enforcing proper waste segregation (Biodegradable, Non-Biodegradable and Recyclable).	2.19	Slightly Implemented	2.23	Slightly Implemented
<b>Overall Mean</b>		<b>2.42</b>	<b>Slightly Implemented</b>	<b>2.31</b>	<b>Slightly Implemented</b>

Table 5 presents the assessment of Beach Resorts owners and managers and the LGU personnel on the Non-compliant Beach Resort solid waste management implementation in terms of reduce.

It can be gleaned from the table that differences in the assessment of the level of implementation in terms of practicing the standard operating procedures for the repair and maintenance of equipment and properties (m=2.66; m=2.42), patronizing locally or community produced foods to lessen waste materials such as plastics, paper, etc. (m=2.63, m=2.42), and using durable furniture (m=2.52; m=2.20) where beach resort owners and managers believe that the mentioned practices are moderately implemented in their resorts while the LGU personnel see it to be slightly implemented, while there is a very good agreement between the assessment of the 2 groups of respondents in the remaining reduce practices such as applying proper food preparation to reduce wastage (m=2.31; m=2.35), prohibiting littering / throwing in public places, such as roads, sidewalks, canals and water areas (m=2.21; m=2.21), and enforcing proper waste segregation enforcing proper waste segregation (Biodegradable, Non-Biodegradable and Recyclable) (m=2.19; m=2.23), where both groups believed that they are slightly implemented. The overall weighted mean for the level of implementation of the solid waste management among the Non-Compliant Beach Resorts in terms of Reduce is 2.4 as assessed by the owners and managers and 2.31 as assessed by the LGU personnel, both interpreted as **sight implementation**.

The reduction or minimization involves all actions aimed at decreasing the amount of waste production. Waste reduction, after prevention, is one of the most important strategies to achieve sustainable development. In practice, waste reduction can be carried out by conducting life-cycle analyses or very thorough mass or material balances (Diaz, 2015). Moreover, this can only be achieved by effective waste prevention at the source which includes the adoption of suitable practices, adjustments in the usage of raw materials, moreover as in technology and production processes. At the domestic level, supply reduction is often done not essentially by adopting engineering but solely by creating appropriate choices within the management of the home such as modification of consumption patterns and modus vivendi by running awareness-raising campaigns to coach the general public and encourage customers to demand merchandise that manufacture less packaging and drive the creation of a more resource efficient market (Bouanini, 2013).

## 2.2 Reuse

**Table 6: Level of Implementation of the Solid Waste Management of Compliant Beach Resorts as Evaluated by the Beach Resort Owners/Managers and LGU/DENR in terms of Reuse**

Reuse		Beach Resort Owners/ Managers		LGU	
		Mean	Decision/ Interpretation	Mean	Decision/ Interpretation
a	Patronizing reusable items such as refillable dispenser for soap, lotion, shampoo and conditioner and liquid soap over disposable items	3.12	Moderately Implemented	3.15	Moderately Implemented
b	Reusing refurbished old furniture	3.19	Moderately Implemented	3.15	Moderately Implemented
c	Donating old items such as towels and containers to schools/non-profits for reuse	3.43	Highly Implemented	3.42	Highly Implemented
d	Keeping old decorations for reuse.	3.57	Highly Implemented	3.63	Highly Implemented
e	Returning of empty bottles such as beer, soft drinks and crates to the supplier for reuse.	3.68	Highly Implemented	3.65	Highly Implemented
<b>Overall Mean</b>		<b>3.35</b>	<b>Highly Implemented</b>	<b>3.38</b>	<b>Highly Implemented</b>

The level of implementation of the solid waste management of beach resorts in terms of reuse as assessed by the beach resort owners and managers and the assessment of the LGU personnel are presented on Table 6. Both the beach resort owners and managers and LGU personnel agree that, here is a high implementation of waste management in terms of reuse on returning of empty bottles such as beer (m= 3.68; m=3.65), soft drinks and crates to the supplier for reuse, keeping old decorations for reuse (m= 3.57; m=3.63), and donating old items such as towels and containers to schools/non-profits for reuse (m= 3.43; m = 3.42). Both group of respondents agree that, there is moderate implementation of waste management in terms of reduce on reusing refurbished old furniture (m=3.19; m=3.15), patronizing reusable items such

as refillable dispenser for soap, lotion, shampoo and conditioner and liquid soap over disposable items ( $m=3.12$ ,  $m=3.15$ ). The LGU personnel gave a higher rating which fall into “**highly implemented**” status while the beach resort owners rated their own implementation to be “**moderate**”. Though a difference was observed in one of the indicators of reuse, the overall weighted mean for the level of implementation of the waste management among the Compliant Beach Resorts in terms of Reuse is 3.35, while it was 3.38 as assessed by the LGU personnel, both with a verbal interpretation of “**Highly Implemented**”.

Most of the compliant beach resorts moderately implement the reusing refurbished old furniture, patronizing reusable items such as refillable dispensers for soap, lotion, shampoo and conditioner, and liquid soap over disposable items, and utilizing the laundry wastewater for cleaning such as parking areas the next best option for SWM is re-use and this encompasses the utilization of an item after its primary use either for a purpose kind of like that that it absolutely was planned for or for a very new one. Reusing things may be by repairing, selling, or donating these items to charity and community groups, and therefore this can reduce waste. Reuse is preferable to recycling since the item does not need to be reprocessed. In addition to environmental thought, sensitive reuse schemes can have important social and cultural benefits. This is exemplified in the reuse of bottles (of beverages) or shopping plastic bags from stores. Reusing materials multiple times or for an additional purpose may also save on solid waste. Some examples of this include refilling a water bottle rather than buying a new one, reusing newsprint as a paper towel to clean items and soak up liquids, using reusable cloth napkins instead of paper napkins; reusing cups instead of paper cups; and reusing grocery bags for garbage collection (Ahmadi, 2017).

**Table 7: Level of Implementation of the Solid Waste Management of Non-Compliant Beach Resorts as Evaluated by the Beach Resort Owners/Managers and LGU/DENR in terms of Reuse**

Reuse	Beach Resort Owners/ Managers		LGU	
	Mean	Decision/ Interpretation	Mean	Decision/ Interpretation
a Patronizing reusable items such as refillable dispenser for soap, lotion, shampoo and conditioner and liquid soap over disposable items	2.61	Moderately Implemented	2.58	Moderately Implemented
b Reusing refurbished old furniture	2.52	Moderately Implemented	2.62	Moderately Implemented
c Donating old items such as towels and containers to schools/non-profits for reuse	2.22	Slightly Implemented	2.23	Slightly Implemented
d Keeping old decorations for reuse.	3.46	Highly Implemented	3.07	Moderately Implemented
e Returning of empty bottles such as beer, soft drinks and crates to the supplier for reuse.	3.59	Highly Implemented	3.42	Highly Implemented
<b>Overall Mean</b>	<b>2.80</b>	<b>Moderately Implemented</b>	<b>2.72</b>	<b>Moderately Implemented</b>

For the Non-Compliant Beach Resort, in terms of reuse, the assessment of the owners and managers as well as the LGU personnel are illustrated in Table 7. The indicator, “The high implementation on returning of empty bottles such beer, soft drinks and carbonated drinks, and crates to the supplier for reuse.” got (m=3.59; m=3.42) as assessed by the owners and managers. The LGU personnel illustrates the strength of the non-compliant beach resorts’ strength in terms of reuse practices. Similar to these is “Keeping old decorations for reuse (m=3.46; m=3.07) where the owners and managers rated themselves to be highly implementing such practice But for LGU personnel, it is just moderately implemented.

Moreover, there is a consistency in the assessment of the 2 groups of respondents as to “patronizing reusable items such as refillable dispenser for soap, lotion, shampoo and conditioner and liquid soap over disposable items” (m=2.61; 2.58) and “reusing refurbished old furniture” (m=2.52; 2.62), both corresponding to **moderate implementation**. Both groups also agree that there is **slight implementation** of waste management in terms of reduce on “donating old items such as towels and containers to schools/non-profits for reuse” (m= 2.22; m=2.23).

The overall weighted mean for the level of implementation of the solid waste management among the Non-Compliant Beach Resorts in terms of Reuse further supports the conclusion that there is a good agreement between the responses of the 2 groups of responses, indicating moderate implementation of the reuse practices as depicted by overall means of 2.80 (owners and managers) and 2.72 (LGU), which corresponds to “**Moderately Implemented**”.

It is evident with the result that they are practicing the returning of empty bottles such as beer, soft drinks or carbonated drinks, and crates to the supplier for reuse, and keeping old decorations for reuse, patronizing reusable items and reusing refurbished old furniture. This activity is reusing materials or equipment that have been used for other purposes. One of the reusing activities is the selling of goods that have not been used. From these findings, it is for all practical purposes associated with the reuse of behavioral interventions should be performed for training or dissemination of information to recover the materials most often used again paper, plastic and glass when in the office and the material of plastic, cloth and wood when intervention done in the community with the goal of family or household (Nindyati, 2014).

### 2.3 Recycle

**Table 8: Level of Implementation of the Solid Waste Management of Compliant Beach Resorts as Evaluated by the Beach Resort Owners/Managers and LGU/DENR in terms of Recycle**

Recycle		Beach Resort Owner/Manager		LGU	
		Mean	Decision/ Interpretation	Mean	Decision/ Interpretation
a	Donating worn – out towels / linens to the community or non-profit organization into rags and bathmats.	3.62	Highly Implemented	3.75	Highly Implemented
b	Using left over foods for organic fertilizers / food for animals.	3.19	Moderately Implemented	3.28	Highly Implemented
c	Providing recycling bins in public areas.	3.62	Highly Implemented	3.45	Highly Implemented
d	Selling recyclable materials to the recyclers.	3.59	Highly Implemented	3.65	Highly Implemented
e	Using recycled plastics and bottles for decorating and enhancing the beach resort.	2.36	Slightly Implemented	2.30	Slightly Implemented
f	Reclaiming and reusing items (such as woods and poles etc.) converted or recycled into other use.	3.17	Moderately Implemented	3.25	Highly Implemented
<b>Overall Mean</b>		<b>3.26</b>	<b>Highly Implemented</b>	<b>3.28</b>	<b>Moderately Implemented</b>

Table 8 presents the level of implementation of the solid waste management of the beach resorts as assessed by the beach resort owners and managers themselves and the LGU personnel. Similar to the previous trends on Reduce and Reuse, there is a very good agreement in the assessments of the Compliant Beach Resorts’ owners and managers and that of the LGU personnel. It shows that if the beach resort owners and managers see they are highly implementing a specific practice, it is the same as that of the LGU personnel assessment. Such, it is established that there is a high implementation of waste management in terms of recycle on “Donating worn – out towels / linens to the community or non-profit organization into rags and bathmats” (m=3.62; m=3.75), “providing recycling bins in public areas” (m=3.62; 3.45), and “selling recyclable materials to the recyclers” (m=3.59; m=3.65).

A slight difference in the rating where the beach resort owners agreed that some the practices were moderately implemented, while the LGU personnel appreciated it much to give a high implementation rating. These are in terms of “reclaiming and reusing items (such as woods and poles etc.) converted or recycled into other use” (m=3.17; m=3.25) and “the use of left-over foods for organic fertilizers / food for animals” (m=3.19; m=3.28).

The slight implementation rating on the practice of “using recycled plastics and bottles for decorating and enhancing the beach resort” (m=2.36; m=2.30), confirms that this area of practice is one of the areas that needs to be focused more on improving to the high implementation rating.

Though slight differences are observed from the responses of the two groups of respondents, the overall weighted mean for the level of implementation of the waste management among the Compliant Beach Resorts in terms of Recycle as assessed by the beach resort owners and managers (m=3.26) is within the same level as it is observed and assessed by the LGU personnel (m=3.28 which, in general corresponds to **Highly Implemented**.

It shows that Compliant Beach Resorts using recycled plastics and bottles for decorating and enhancing the beach resort is the least practice.

**Table 9: Level of Implementation of the Solid Waste Management of Non- Compliant Beach Resorts as Evaluated by the Beach Resort Owners/Managers and LGU/DENR in terms of Recycle**

Recycle		Beach Resort Owner/Manager		LGU	
		Mean	Decision/ Interpretation	Mean	Decision/ Interpretation
a	Donating worn – out towels / linens to the community or non-profit organization into rags and bathmats.	2.61	Moderately Implemented	2.77	Moderately Implemented
b	Using left over foods for organic fertilizers / food for animals.	2.88	Moderately Implemented	2.90	Moderately Implemented
c	Providing recycling bins in public areas.	2.96	Moderately Implemented	2.70	Moderately Implemented
d	Selling recyclable materials to the recyclers.	3.51	Highly Implemented	3.22	Moderately Implemented
e	Using recycled plastics and bottles for decorating and enhancing the beach resort.	2.79	Moderately Implemented	2.62	Moderately Implemented
f	Reclaiming and reusing items (such as woods and poles etc.) converted or recycled into other use.	2.74	Moderately Implemented	2.78	Moderately Implemented
<b>Overall Mean</b>		<b>2.92</b>	<b>Moderately Implemented</b>	<b>2.83</b>	<b>Moderately Implemented</b>

Table 9 displays the assessment of the 2 groups of respondents on the waste management in terms of recycle of the Non-Compliant Beach Resorts, There is a very good agreement on the assessment of the owners and managers and that of the LGU personnel since both group rated the implementation on providing recycling bins in public areas (m=2.96; m=2.70), using left over foods for organic fertilizers / food for animals (m=2.88; m=2.90), using recycled plastics and bottles for decorating and enhancing the beach resort (m=2.79; m=2.62), reclaiming and reusing items (such as woods and poles etc.) converted or recycled into other use (m=2.74; m=2.78), and Donating worn – out towels / linens to the community or non-profit organization into rags and bathmats (m=2.61; m=2.77) to be **moderately implemented**. The practice in waste management implementation in terms of reuse that obtained the highest mean is the practice of “selling recyclable materials to the recyclers” (m=3.51; m=3.22), which is rated by the owners and managers to be **highly implemented**, while rated **moderately implemented** by the LGU personnel. The overall weighted mean for the level of implementation of the waste management among the Non-Compliant Beach Resorts as assessed by the owners and

managers (m=2.92) and that of the LGU personnel (m= 2.92) both correspond to **moderately implemented**. This illustrates further the consistency in the practice by owners and managers of beach resorts and how it is enforced by the country. The findings show that beach resorts **moderately implement** recycling by providing bins in public areas, using left over foods for organic fertilizers / food for animals, using recycled plastics and bottles for decorating and enhancing the beach resort, reclaiming and reusing items, and converting worn – out towels / linens into rags and bathmats. The things people use every day, like paper bags, soda cans, and milk cartons, are made from materials that can be recycled. In some cities, most of the recyclables are put into separated bins outside the home, so that a truck can return and collect them frequently (Abella, 2013) and recycling of the product which consists of handling and transforming the waste into novel and marketable. (Mohan, Deepak & Mona, 2017).

**Table 10: Test for the Difference on the Level of Implementation of the Solid Waste Management between Compliant and Non-Compliant Beach Resorts Owners/Managers and LGU/DENR**

Implementation of the Waste Management	Compliant Beach Resorts		LGU		t-value	p-value (2-tailed)	Decision on Ho (α= 5%)	Interpretation
	Mean	SD	Mean	SD				
Reduce	3.36	0.19	3.46	0.17	-1.02	0.333	Accept	Not Significant
Reuse	3.35	0.25	3.38	0.23	-0.206	0.421	Accept	Not Significant
Recycle	3.26	0.49	3.28	0.52	-0.074	0.178	Accept	Not Significant
Implementation of the Waste Management	Non-Compliant Beach Resorts		LGU		t-value	p-value (2-tailed)	Decision (α= 5%)	Interpretation
	Mean	SD	Mean	SD				
Reduce	2.42	0.21	2.31	0.10	1.145	0.279	Accept	Not Significant
Reuse	2.79	0.58	2.72	0.44	0.251	0.807	Accept	Not Significant
Recycle	2.92	0.32	2.83	0.21	0.538	0.603	Accept	Not Significant

SD = Standard Deviation; Ho=null hypothesis

Table 10 shows the tests for the difference in the assessment of the beach resort owners and managers and LGU personnel on the level of implementation of solid waste management in terms of reduce, reuse and recycle grouped into compliant and non-compliant beach resorts. There is a very good agreement between the assessment of the compliant and non-compliant beach resort owners and managers and that of the LGU personnel as to the implementation of reduce, reuse and recycle. All p-values were found to be greater than 0.5 which resulted in the acceptance of the null hypothesis indicating no significant difference in the assessment of the 2 groups of respondents on the waste management implementation. The level of compliance indicates that both compliant and non-compliant beach resorts are doing their part to manage their waste efficiently and effectively based on the mandates of the government. Though it is also clearly seen that the level of implementation in a compliant beach resort is far more at par to the standards as compared to the non-compliant beach resort. The proximity of the overall

means in all 3 areas reduce, reuse and recycle between the beach resort owners/manager and of the LGU personnel indicates that the implementation is religiously being done in the beach resorts and is also regularly monitored by the LGU. This was proven by the non-significance in the differences of the assessments. The negative t-values in the tests for difference in the non-compliant beach resort owners and managers' assessment indicate that these beach resorts are slightly higher than that of the assessment of the LGU personnel. On the other hand, this slight difference is not significant to educate the non-compliant beach resort owners and managers on how to perform self-assessments.

### 3. Difference on the Level of Implementation of the Solid Waste Management between Compliant and Non-compliant Beach resorts in Region III

**Table 11: t-Test for the Significant Difference on the Level of Implementation of the Waste Management between Compliant and Non-Compliant Beach Resorts**

Implementation of the Waste Management	Compliant Beach Resorts		Non-Compliant Beach resorts		t-value	P-value (2-tailed)	Decision ( $\alpha= 5\%$ )
	Mean	Standard Deviation	Mean	Standard Deviation			
Reduce	3.37	0.19	2.42	0.21	8.238	0.000	Reject Ho (Significant)
Reuse	3.35	0.25	2.79	0.58	3.134	0.049	Reject Ho (Significant)
Recycle	3.26	0.49	2.92	0.32	<b>1.448</b>	<b>0.178</b>	<b>Accept Ho (Not Significant)</b>

Table 11 reflects the computed t-values for the significant difference on the level of implementation of the solid waste management between Compliant and Non-Compliant Beach Resorts. In terms of Reduce, the computed t-value is 8.238 which is significant at an alpha value of 5%, resulting to the rejection or non-acceptance of the null hypothesis. This shows that the level of implementation on reducing waste between the two groups of beach resorts is not the same. The Compliant Beach Resorts rated the implementation as highly implemented while the Non-compliant Beach Resorts rated it as slightly implemented. This can be attributed to a few reasons as indirectly stated by Arogundade (2021) in his article in BioEnergy Consult. One is the fact that the baseline budget of the non-complainant could have been in the lowest already that they find difficulty in looking for a more inexpensive or cheaper materials as to what they are presently using. In addition, reduction of waste as waste management practice also requires added costs on investment and operations. Another is the quality of the cheapest material that might not conform with the quality standards of materials used in beach resorts. In addition, financing of solid waste management projects can be overwhelming.

In terms of Reuse, the null hypothesis is also rejected since the computed t-value of 3.134 is significant at 5% level. The Compliant Beach Resorts rated the implementation on reusing waste materials as highly implemented while the Non-compliant Beach Resorts rated it as moderately implemented. There is a difference in the way they implement reusing waste materials. These results are moreover, related to the significance of the waste reduction implementation as previously found out. Mendoza (2018) mentioned that in Solid Waste



Management and its implementation, reusing waste also requires added cost in terms of sanitizing the used waste item as well as the cost of investment on the aesthetics of its presentation to clients. This reused waste as it is appearing to the clients must appear in good shape, clean and functional. On the other hand, food material reuse is not much practiced in beach resorts due to some policies of hygiene and quality standards. This area of reusing, therefore, is a current gray area for non-compliant beach resorts due to financial constraints.

However, in terms of Recycle, the computed t-value is 1.448 which is not significant at 5% level, thus the null hypothesis is accepted. Thus, the Compliant Beach Resorts are applying more the recycling of waste material with high implementation compared to Non-compliant with moderate implementation. The difference in the way they implement recycling of waste is not significant. This reveals that recycling waste materials is commonly practiced by Compliant Beach Resorts. However, reducing, and reusing waste materials are commonly practiced by both types of resorts. Kasim (2017) cited that there is a significant difference in the waste management practices of restaurants, hotels and resorts when grouped according to their size, capitalization, number of trained personnel and the number of guests. He further explained that big establishments tend to be more compliant than small ones in terms of environmental policies and regulations. Big establishments practice well the proper handling of waste products and they tend to practice more the 3R's.

## 5. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the study, the researcher concludes that less than half of the beach resorts are compliant with the requirements by Local Government Unit (LGU) / Department of Environment and Natural Resources (DENR) on using safe and latest equipment in handling waste products. Majority of the Non-Compliant Beach Resorts do not comply in terms of records, design and operation because these beach resorts are not abiding to the standard operating procedures anchored in the policies and regulations of the government. The Compliant Beach Resorts highly implement reduce, reuse and recycle in the implementation of solid waste management while the Non-Compliant Beach Resorts slightly implement reducing of waste and moderately reuse and recycle waste materials because the business processes or operation of these beach resorts is in accordance with RA No. 9003. Intensification of the 3Rs is the key to a more efficient implementation of waste management among beach resorts. Based on the findings and conclusions of the study, the researcher came up with the following recommendations: (1) The Local Government Units must intensify strict monitoring of records, design, and operation for widespread compliance among beach resorts. (2) There must be an intensive awareness campaigns on the Reduce, Reuse and Recycle of solid waste management among the Local Government Units, Public Health Employees, and Beach Resorts Management. A strict compliance and implementation of 3R's (Reduce, Reuse and Recycle) and RA No. 9003 must be imposed among them. For the non-compliant beach resorts, strict monitoring program must also be imposed to improve their solid waste management practices. (3) The Local Government Units must intensify Solid Waste Management and Beach Management drive through initiating seminars /training for owners and personnel of beach resorts. (4) Parallel study must also be conducted using different settings, respondents, and

variables to validate the findings of this research.

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