

Solid Wastes Recycling Practices of Hotels in Aba and Umuahia Metropolises of Abia State Nigeria

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Abstract: *The study examined the extent of solid waste recycling practices employed by hotels in Aba and Umuahia metropolises of Abia State, Nigeria. Urban cities in Nigeria face challenges with waste management and it has been discovered that hotels play major roles in generating massive quantities of solid wastes in our environment. Recycling which is an important 21st century innovation seems not to be utilized by hotels as a waste management strategy even with its numerous advantages. The objective of the study is to examine the extent hotels recycle solid wastes in major urban cities in Abia State. 434 hotel managers and heads of housekeeping department of all the registered hotels in Aba and Umuahia metropolises made up the population for the study but with 420 as valid respondents. Survey research design was adopted through the use of questionnaire. Mean distribution and standard deviations were used to analyze the research question while t-test was used to test the hypothesis formulated for the study. Findings of the study showed that hotels in Aba and Umuahia metropolis of Abia State recycle food waste to a high extent but recycle other types of solid wastes to a limited extent. Hotels are therefore advised to fully engage in unlimited recycling especially with solid wastes which are merely discarded or sold to scrap and waste buyers.*

Keywords: hotel solid wastes, recycling practices, green practices and environmental sustainability

INTRODUCTION

The hotel sector by their nature of products and services produce significant amount of wastes and it is essential to recognize that much of this waste can negatively impact the local community, the environment, and even the customers that the hotel strives to satisfy. Waste management is one of the most challenging responsibilities that hotel managers must undertake. In recent years, there

has been a growing focus on revisiting and adapting waste management within numerous organizations worldwide, aiming to align it with evolving economic and social circumstances (McAllister, 2015). Hotel is a key component of tourism that provides accommodation both in and around destinations. To Radwan, Jones, and Minoli (2010) in Guidoni, Peruchin, Correa, Marques, Vierra, Siqueira, and Correa (2018), hotels contribute to environmental degradation worldwide by the disposal of thousands of tons of waste in landfills. The increase in the various solid waste residues in hotels particularly those that do not easily decompose either in nature or by weathering factors for thousands of years such as wastes of glass bottles, metal, plastics, paper, and ceramics tends to contribute to environmental degradation.

In developing countries, Nigeria inclusive, solid waste management (SWM) of the hospitality industry is still a big problem. McAllister (2015) affirms that in numerous developing countries, solid waste management has emerged as a significant concern due to industrial advancements, expanding urban areas, and rapid growth. Nowadays, many companies and hotel chains are making efforts to promote their environmental commitment to differentiate from their competitors (Park, Kim & McCleary, 2014). According to Han, Hsu, Lee, and Sheu (2011), companies are increasingly concerned with the environmental impacts arising from their activities, which cause hotels to invest in environmental practices that affect guests' preferences. 3R strategy of waste management (Reduce, Reuse and Recycle) is used to improve environmental practices to ensure proper waste management (Witchai-Utcha & Chavalparit, 2019) with recycling being the main focus of this study. According to Mohan, Deepak and Mona (2017), 30% of a hotel's solid waste can be sorted, reused, recycled or recovered. As reported by Bohdanowicz (2006), 80% of hotels in Sweden and 30.6% of hotels in Poland have active waste sorting and recycling programs. However, in Nigeria and several other developing countries, little is known about what approaches hotels use in recycling its solid wastes. Hotels that adopt environmentally friendly practices such as waste recycling demonstrate a commitment to social responsibility, which can attract potential customers who value organizations that prioritize positive environmental initiatives (Golomeova et al. 2013). Hotels can participate in the trend of solid waste recycling, to bolster their organizational strategies.

Recycling is the process of converting waste materials into new materials and objects (Oldenziel & Weber, 2013). It is an alternative to conventional waste disposal that can save material and help lower greenhouse gas emissions. When citizens recycle waste, it is considered an act of responsible 'green' citizenship (Oldenziel & Weber, 2013). Recycling means re-using what has been used, that is, re-converting waste into a new product that can be sold. Recycling is an obvious treatment of solid waste problem; it is an important way of collecting solid waste materials and turning them into useful products. Before now, people have been collecting old newspapers, glass

bottles, metals, plastics and other recyclables for recycling purposes; from primary waste collectors to landfill scavengers to scrap buyers who then sell to large recycling companies. While recycling is a very important aspect of waste management, authorities in developing countries tend to overlook the significance of waste minimization strategies, leading to situations where more waste than necessary is sent to disposal sites. In today's terms, 'recycling' similarly includes both: the ordinary reuse of items and the fundamental transformation of materials (Oldenzien & Weber, 2013).

According to Achilias (2012), if the 20th century was marked by a significant rise in material production and consumption, contributing to improved living standards, it is possible to perceive the 21st century as a time that has the potential to be seen as the age of recycling. Hotels should look for ways to reduce costs while enabling the use of recyclables to reduce the generation of residual materials (Guidoni et al., 2018). Companies are encouraged to improve their environmental efficiencies each year. One way to do this is by improving a company's waste management with a new recycling service such as solid waste recycling. Glass, food waste, paper and cardboard, plastic bottles and so on are some of the things that can be recycled (McAllister, 2015).

Today is the green economy era, and green strategies like recycling can provide great benefits to the hotel industry (Omidiani & HashemiHezaveh, 2016). Environmental Sustainability and ecological benefits through green product innovations have recently gained significance due to an increase in issues such as global warming, CO2 emissions, increased waste, and other ecological hazards (Alsharif & Tong, 2019). In the era where environmentally friendly practices are promoted within the hospitality industry, hotel managers should embrace innovations, particularly solid waste recycling. Since the world is revolving around technology and innovation, it will be a move in the right direction if hotels join in the recycling campaign to utilize their solid wastes in producing secondary products. This and many more innovative ideas are a part of what will shape the hospitality and tourism industry in the future because how businesses will survive in the future, depends a lot on how current trends that run the world is being understood, today and tomorrow.

This study was carried out in Aba and Umuahia metropolises of Abia State. Abia State accommodates a considerable number of hotels, whose operations contribute to the waste management issue in the State. Hotel business is one of the lucrative businesses that appeal to investors in the State. This can be seen in the number of existing and developing hotels strategically situated in major cities of the State. The expansion and increased intensity of human activities, driven by the influx of individuals from neighboring states and other parts of Nigeria who engage in business within Abia's major cities may be identified as the contributing factors. These cities face a significant challenge with solid waste management as households, markets, hotels, and various industries within the cities currently practice indiscriminate waste disposal. It is widely acknowledged that among the prevailing issues in urban cities of Abia State, solid waste management stands out as the most prominent concern (Izugbara & Umoh, 2004). There is

currently no organized waste disposal and management system in Abia State hence, solid waste can be seen in huge heaps on any piece of unused land, around buildings, along the road, and in open places. Living with solid waste littered around appears to be acceptable among the people. Two major urban cities of Aba and Umuahia metropolises of Abia State were thus selected to examine the extent that hotels in these cities recycle its solid waste for environmental sustainability by reducing the impact of waste in the environment. Biondo (2012) concurs with this notion by asserting that the hospitality industry is one of the most polluting industries and needs to support environmental sustainability by adopting sustainable measures while caring for the environment. The objective of this study is therefore to examine the extent hotels recycle solid wastes in Aba and Umuahia metropolises of Abia State.

LITERATURE REVIEW

Hotel solid wastes

Generally speaking, waste from the hospitality industry consists of both wet (organic/biodegradable) and dry waste (non-biodegradable). The wet waste consists primarily of food waste (Wagh, 2008), which can account for more than 50% of the hospitality waste (Curry, 2012) and up to one third of all the food served within the hospitality sector (Marthinsen, Kaysen & Kirkevaag, 2012). Hotels are one of the major sources of solid waste generation (Omidiani & HashemiHezaveh, 2016).

A hotel guest is estimated to generate up to 1 kg of waste per day on average and this amounts to millions of tons of waste being generated worldwide annually (Omidiani & HashemiHazaveh, 2016). The amount of waste generated is said to double on checkout days (Shanklin, Petrillose, & Pettay, 1991). According to International Hotels Environment Initiative (IHEI, 2002), solid waste generated by hotels is one of the most adverse environmental impacts of hotels. The lack of attention to solid waste management by some hotels has been attributed to lack of funds and knowledge as well as poor decision-making (Ghadban, Shames, & Mayaleh, 2016; Malik & Kumar, 2012)

In view of the fact that hotels contribute to the waste problem in cities, any attempt to arrest the problem in cities is bound to fail if hotels are not included in such a plan. As one of the main generators of wastes, it is imperative that hotels champion waste management at the destination. Wastes generated by hotels, if not properly managed, could have a debilitating effect on the environment (Mensah, 2020). The importance of studying hotel management in order to minimize waste cannot be overemphasized (Omidiani & HashemiHezaveh, 2016).

Types of hotel solid wastes

According to Zein, Wazner and Meylan (2008), the components of hotel waste along with their sources which show non-hazardous types of waste are written below:

Tables 1: Types of non-hazardous waste in the hotel industry

Type of Non-hazardous waste	Component Highlight	Source
Household wastes	Food/kitchen waste, used or dirty paper and wrapping, plastic wrapping or bags, composted wrappers	Hotel's different departments
Cardboard	Packings	Hotel's purchasing and other departments
Paper	Printed documents, brochures, menus, maps, magazines, newspaper	Administration, reception, guests room, restaurants
Plastic	Bags, bottles (that did not contain hazardous material), household goods, individual portion wrappers for various products	Kitchen, restaurants, bars, guest room, Administration
Metal	Tin cans, jar lids, soda cans, food containers, mayonnaise, mustard and tomato puree tubes, aluminium packing	Kitchen, restaurants, bars, guest room
Glass	Bottles, jars, flasks	Kitchen, restaurants, bars, guests rooms
Cloth	Table cloth, bed-linen, napkins, clothes, rags	Kitchen, restaurants, bars, bathrooms, guests rooms
Wood	Wooden packing pallets	Purchasing department
Organic waste	Fruit and vegetables peelings, flowers and plants, branches, leaves, grass	Kitchen, restaurants, bars, guests rooms, gardens

Source: Zein, Wazner and Meylan (2008). Best Environmental Practices for the Hotel.

Concept of waste recycling

The concept of recycling is still being explored. This is the extraction and recovery of valuable materials from scraps or other discarded materials employed to supplement the production of new materials. It is essentially adding value to waste, making it economically useful (Okenyi Ngozi-Olehi & Njoku, 2011; Adu & Aremu, 2012; Awopetu, Coker, Awopetu, Awopetu, Booth, Fullen, Hammond & Tannahill, 2013). In this business, many players are involved; ranging from small

primary paper collectors or landfill scavengers to a medium scale scraps metal middleman and a large recycling industry (Chong, 2006) in Johari, Alkali, Hashim, Ahmed and Mat (2014). It was also reported that the waste standards for recyclable materials, recycled products and recycling industry standards in the waste minimization plan or strategy are also not well addressed (Mohamed, 2012) in Johari et al (2014).

The ‘waste problem’ demands a solution on a local, national and international level. Technological advances like recycling is part of the solution to waste problem (Botetzagias, 2015). Waste recycling has enormous economic opportunities, including job creation, poverty alleviation, and sustainable development (Adebola, 2005) in Olukanni (2018). Recyclable materials in low, middle, and high-income countries comprise about 17%, 43%, and 62% of the total waste stream, respectively (Adu & Aremu, 2012). There are many benefits that can be connected to recycling. These include healthier land, air, and water (Sonnenfeld, 2018). Recyclable solid wastes include textiles, construction waste, paper, plastic, ferrous and non-ferrous metals and glass. Plastic recycling industries shred plastics into pellets to manufacture other plastics and allied products. Some recycling factories process waste paper and cardboard to make tissue paper, newsprint, or bulk packaging materials. Waste glass is processed by glass or terrazzo companies, nonferrous metals are processed by aluminum smelters, and tin is recovered from aerosol cans (Agbaeze, Onwuka, & Agbo, 2014). Agunwamba (2003) as cited in Olukanni et al (2018) observed that a well-planned recycling program in Nigeria could result in savings of up to 78% in waste management costs and 79.5% in landfill avoidance costs. Aside from the economic gains of recycling, environmental benefits, such as the reduction of greenhouse gas emissions, air and water pollution associated with production from virgin raw materials, are likely to accrue from waste recycling (Adu & Aremu, 2012).

Overall, recycling reduces the amount of waste sent to landfills and incinerators, conserves natural resources, and prevents pollution and greenhouse emissions caused by the manufacturing of new goods from virgin materials (Becker, 2014). Recycling consists of two distinct stages that may take place within the same site: sorting and re-processing. Initially, it should be noted that every fraction of recyclable materials is separated from the inappropriate ones. The recycling activity results in the generation of the so-called “secondary materials”, which may replace the “primary materials” during the production process (Baniyas et al, 2020). Other classifications of recycling routes also deserve mentioning. For example, if the recycled material is of lower value (or quality) than the original product, this is termed *downcycling*. In contrast, if a product from recycled material is of higher value (or quality) than the original product, it is termed *upcycling* (Sandin & Peters, 2018).

Recycling is both an environmental and economic issue. Many people are motivated to recycle because of environmental concern that is, it reduces pollution, it also save energy, space and resources, helps to protect biodiversity and reduce litter. Economically, it can save money for items such as paper, metals and some plastics (Birhanu & Berisa, 2015). Recycling behavior is strongly

influenced “by the knowledge of where, when, and how to recycle” as Stated by O’Connell (2011). The findings of a study conducted in over twenty-two developing countries suggests that when citizens receive information about the benefits of recycling and how to sort the waste, and they participate in the designing of the programs, they are more likely to participate in recycling campaigns (Guerrero et al, 2013) in McAllister (2015). Social norms can also play an important role in changing waste behavior and participation in recycling activities. People are more likely to recycle when they observe others in their community recycling, so it would be beneficial to reach out to key members of the communities to take the lead on changing these negative environmental behaviors (O’Connell, 2011) in McAllister (2015).

According to Svensson (2014), Seven times Sweden’s total emissions are saved each year by the recycling industry. Recycling reduces Carbon dioxide (CO₂) emissions and helps protect the environment. The European Union recorded that recycled metals cut CO₂ emissions by nearly 200 million tons each year. In fact, recycling annually reduces global CO₂ emissions by 500 million tons. Recycling provides new raw materials and contributes to saving energy. Today the recycling industry provides half of the world’s raw materials. Recycled aluminum uses 95% less energy than goods produced from virgin metal. Recycling iron and steel leads to a 74% energy savings and also reduces water and air pollution by 76% and 86%, respectively, compared to primary production (Svensson, 2014).

The recycling industry provides half of the world’s raw materials and this figure is set to increase (Svensson, 2014). It is about environmentally sound management of resources. It is about plain common sense. There has to be a political willingness to facilitate recycling in every way and from a corporate perspective, social responsibility is becoming an increasingly important competitive edge. This is also a communication issue; it has to be a fact that is well known to the market when a company is doing valuable environmental work (Svensson, 2014).

THEORETICAL FRAMEWORK

The theoretical framework of the study comprises of the diffusion of innovative theory which was used to underpin this study. This theory was developed by Everett M. Rogers in 1962 and is one of the oldest social science theories. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. The end result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption means that a person does something differently than what they had previously (that is, purchase or use a new product, acquire and perform a new behavior, among others). The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible. Recycling is an innovative idea which the hotel industry can adopt to manage its solid waste effectively.

METHODOLOGY

The research was carried out in Aba and Umuahia metropolises of Abia State. The research design for this study is survey design through the use of questionnaire to elicit information from respondents. The objective of the study is to examine the extent of solid waste recycling practices employed by hotels in Aba and Umuahia metropolises of Abia State. The population of the study comprises of all the hotel managers and heads of housekeeping department of two hundred and seventeen (217) registered hotels in Aba and Umuahia metropolises. All the members of the population were sampled. Questionnaires were printed and distributed to the respondents which were retrieved after completion. The questionnaire was validated by experts and tested for reliability using cronbach alpha coefficient. A reliability coefficient of $\alpha = .959$ was obtained which demonstrates very high internal consistency. Mean and standard deviations were used to analyse responses from the two metropolises while T-test was used to test the hypothesis formulated for the study to check for significant differences in the solid waste recycling practices employed by hotels in the two locations. All completed and valid questionnaire was used for analysis.

RESULTS/FINDINGS

H₀₂: The extent of solid waste recycling practices employed by hotels in Aba metropolis is not statistically different from the extent practiced by hotels in Umuahia metropolis.

To evaluate this null hypothesis, an independent sample t-test was conducted, and the results were presented and interpreted below in detail.

Table 2 Group Statistics of Independent Samples T-test for Hypothesis

Waste Type	Metropolis	N	Mean	Std. Deviation
Food wastes	Aba	232	3.6300	1.1780
	Umuahia	188	3.6100	1.1760
Paper waste	Aba	232	1.5100	1.0890
	Umuahia	188	1.3900	0.9730
Plastic waste	Aba	232	2.0100	1.2180
	Umuahia	188	2.0500	1.2550
Metal waste	Aba	232	2.2300	1.3860
	Umuahia	188	2.0800	1.3640
Glass waste	Aba	232	2.2800	1.3840
	Umuahia	188	2.1600	1.3080
Cloth materials	Aba	232	2.0700	1.1030
	Umuahia	188	1.8000	1.1150
Wood waste	Aba	232	1.7200	1.1420
	Umuahia	188	1.5500	1.0860
Organic waste	Aba	232	1.1400	0.3920
	Umuahia	188	1.0600	0.2850
Overall Score	Aba	232	16.5900	3.3120
	Umuahia	188	15.7100	5.5140

Source: Independent Samples t-test Result from SPSS 25

Table 2 illustrates the mean scores and standard deviations for various types of solid waste recycling in Aba and Umuahia, providing a comprehensive analysis of differences in perceptions between the respondents in the two cities.

Food Waste Recycling: Table 2 reveals that the mean score for food waste recycling in Aba (3.6300) is slightly higher than in Umuahia (3.6100). This difference suggests that Aba might have a more robust food waste recycling program. However, statistical validation is required to confirm this observation. The independent sample t-test p-value, discussed in the next table, will determine the significance of this difference. The standard deviations for Aba (1.1780) and Umuahia (1.1760) indicate similar levels of variability in responses, but Aba's marginally higher standard deviation suggests a slightly broader range of opinions on food waste recycling. This variability could reflect diverse practices and attitudes toward food waste recycling in Aba.

Paper Waste Recycling: In the case of paper waste, Aba exhibits a marginally higher mean score (1.5100) compared to Umuahia (1.3900). This suggests that respondents in Aba view paper waste recycling more favorably. However, relying solely on mean differences is insufficient for concluding. The p-value from the independent samples t-test will provide the necessary statistical context to determine if this difference is significant. The standard deviations for paper waste are 1.0890 in Aba and 0.9730 in Umuahia. The higher standard deviation in Aba indicates a wider range of perceptions about paper waste recycling, which might reflect differing levels of awareness or engagement in recycling practices.

Plastic Waste Recycling: The mean score for plastic waste recycling is slightly higher in Umuahia (2.0500) compared to Aba (2.0100). This initial observation implies that plastic waste recycling might be more prevalent or better perceived in Umuahia. To verify this, the independent sample t-test p-value will be analyzed. The standard deviations (1.2180 for Aba and 1.2550 for Umuahia) reveal greater variability in Umuahia, suggesting that perceptions of plastic waste recycling are more diverse there. This could be due to the varying effectiveness of recycling initiatives between the two metropolises.

Metal Waste Recycling: For metal waste recycling, Aba has a higher mean score (2.2300) than Umuahia (2.0800), indicating a potentially stronger recycling effort in Aba. However, statistical confirmation is needed to support this observation. The p-value from the independent samples t-test will be evaluated to determine significance. The standard deviations (1.3860 for Aba and 1.3640 for Umuahia) show that both metropolises have relatively similar levels of variability, though Aba's slightly higher standard deviation suggests more varied opinions on metal waste recycling. This could be indicative of higher number of metal recycling companies and awareness programs in Aba metropolis.

Glass Waste Recycling: The respondents' perception on glass waste recycling show a higher mean score in Aba (2.2800) compared to Umuahia (2.1600). While this suggests better recycling efforts in Aba, the significance of this difference will be assessed using the independent samples

t-test p-value. The standard deviations (1.3840 for Aba and 1.3080 for Umuahia) provide additional insights, with Aba's higher standard deviation pointing to more diverse views on glass waste recycling. This could be due to differences in the availability of recycling facilities within the two metropolises.

Cloth Materials Waste Recycling: Cloth materials waste recycling is perceived more favorably in Aba, with a mean score of 2.0700 compared to Umuahia's 1.8000. This difference suggests that Aba might have more established or effective cloth recycling programs. The upcoming analysis of the p-value from the independent samples t-test will determine the statistical significance of this difference. The standard deviations (1.1030 for Aba and 1.1150 for Umuahia) indicate that Umuahia has a slightly broader range of perceptions, possibly due to varying levels of clothing education in schools around the metropolis or awareness about cloth materials recycling.

Wood Waste Recycling: The mean score for wood waste recycling is higher in Aba (1.7200) than in Umuahia (1.5500), suggesting more active recycling efforts in Aba. However, to validate this observation, the p-value from the independent samples t-test will be examined. The standard deviations (1.1420 for Aba and 1.0860 for Umuahia) show that responses are more varied in Aba, reflecting a wider range of opinions on wood waste recycling. This could be influenced by the number of outdoor catering events engaged in by hotels in Aba metropolis or reuse for building purposes.

Organic Waste Recycling: Organic waste recycling is perceived slightly more positively in Aba, with a mean score of 1.1400 compared to 1.0600 in Umuahia. To determine if this difference is statistically significant, the p-value from the independent samples t-test will be analyzed. The standard deviations (0.3920 for Aba and 0.2850 for Umuahia) suggest greater variability in Aba, indicating a broader range of views on organic waste recycling. This might be due to differences in local composting programs or awareness initiatives, and business knowledge.

Overall Waste Recycling: Table 2 presents the overall waste material recycling ratings, with Aba showing a higher mean score (16.5900) compared to Umuahia (15.7100). This suggests that respondents in Aba might perceive the overall recycling efforts more favorably. However, the independent samples t-test p-value will determine the statistical significance of this difference. The standard deviations (3.3120 for Aba and 5.5140 for Umuahia) highlight a greater variability in Umuahia, indicating more diverse perceptions of overall waste recycling. This could be due to differing levels of infrastructure, public awareness, and engagement in recycling activities between the two cities.

While initial observations based on mean differences provide insights, the subsequent analysis of p-values from independent samples t-tests will establish the statistical significance of these findings. This rigorous approach ensures that any identified differences in waste recycling perceptions of hotels between Aba and Umuahia are not attributed to random chance but reflect genuine disparities.

Table 3 Independent Samples T-test for Hypothesis

		Levene's Test		t-test for Equality of Means			
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference
Food wastes	Equal variances assumed	0.024	0.877	0.115	418	0.908	0.0130
	Equal variances not assumed			0.115	400.37	0.908	0.0130
Paper waste	Equal variances assumed	4.168	0.042	1.171	418	0.242	0.1190
	Equal variances not assumed			1.185	414.04	0.237	0.1190
Plastic waste	Equal variances assumed	0.573	0.450	-0.288	418	0.773	-0.0350
	Equal variances not assumed			-0.287	395.14	0.774	-0.0350
Metal waste	Equal variances assumed	0.673	0.412	1.133	418	0.258	0.1530
	Equal variances not assumed			1.135	402.62	0.257	0.1530
Glass waste	Equal variances assumed	1.621	0.204	0.870	418	0.385	0.1150
	Equal variances not assumed			0.875	408.28	0.382	0.1150
Cloth materials	Equal variances assumed	0.807	0.369	2.493	418	0.013	0.2710
	Equal variances not assumed			2.490	398.39	0.013	0.2710
Wood waste	Equal variances assumed	2.347	0.126	1.481	418	0.139	0.1620
	Equal variances not assumed			1.489	407.46	0.137	0.1620
Organic waste	Equal variances assumed	18.677	0.000	2.166	418	0.031	0.0740
	Equal variances not assumed			2.237	413.39	0.026	0.0740
Overall Score	Equal variances assumed	51.005	0.000	2.007	418	0.045	0.8730
	Equal variances not assumed			1.910	292.11	0.057	0.8730

Source: Independent Samples t-test Result from SPSS 25

Table 3 presents the overall scores for waste recycling practices, highlighting the results of Levene's test for equality of variances. The test reveals a significant F statistic value of 51.005 and a p-value of 0.000, indicating that the assumption of equal variances should be rejected as the p-value is less than 0.05. Consequently, the analysis proceeds under the assumption of unequal variances.

An independent samples t-test, based on the "equal variances not assumed" row, was conducted to evaluate the mean differences in waste recycling practices ratings between respondents in Aba and Umuahia. The t-test yielded a value of 1.910 with a p-value of 0.057 and a mean difference of 0.8730. Since the p-value exceeds the significance level of 0.05, the null hypothesis - stating no significant difference in waste recycling practices between hotels in Aba and Umuahia - cannot be rejected. Therefore, the study concludes that respondents in both metropolises perceive their waste recycling practices as statistically similar.

Following the overall evaluation, the study delves into a more granular analysis of individual waste recycling practices to uncover any significant differences between recycling practices of hotels in Aba and Umuahia.

Food Waste: The p-value for food waste recycling practices is 0.908, well above the 0.05 significance level. This indicates no statistically significant difference in food waste recycling in the two metropolises.

Paper Waste: With a p-value of 0.237, the analysis shows no significant difference in paper waste recycling practices between Aba and Umuahia.

Plastic Waste: The p-value for plastic waste recycling is 0.773, suggesting similar practices between the hotels in both metropolises.

Metal Waste: The p-value of 0.258 indicates no significant difference in the recycling practices of metal waste between the two metropolises.

Glass Waste: A p-value of 0.385 shows no significant difference in glass waste recycling practices.

Wood Waste: The p-value of 0.139 suggests that wood waste recycling practices are not significantly different between hotels in Aba and Umuahia.

However, a noteworthy exception emerges with cloth materials waste and organic waste, as these two categories stand out with statistically significant differences.

Cloth Materials Waste: The p-value of 0.013 indicates a significant difference in the recycling practices of cloth materials waste. The mean difference of 0.2710 suggests that there is higher level of cloth materials waste recycling in hotels in Aba metropolis compared to their counterparts in Umuahia.

Organic Waste: The p-value of 0.031 also indicates a significant difference in organic waste recycling practices, with a mean difference of 0.074. This suggests that organic waste recycling efforts is more favorably in hotels in Aba metropolios than Umuahia metropolis.

While the overall waste recycling practices among hotels in Aba and Umuahia metropolises are statistically similar, significant differences exist in the specific areas of cloth materials and organic waste recycling. These findings highlight the need for targeted strategies to address these discrepancies and enhance waste recycling practices across hotels in both metropolises.

DISCUSSION OF FINDINGS

The investigation into waste recycling practices in Aba and Umuahia metropolises sought to determine if there exists a significant difference in the extent of recycling efforts employed by hotels in the two metropolises. Levene's test for equality of variances revealed a significant F statistic value, indicating unequal variances between the two groups. However, the subsequent independent samples t-test, conducted under the assumption of unequal variances, yielded a non-significant result, indicating no significant difference in waste recycling practices between the two cities. A granular analysis of individual waste recycling practices further supported these findings. While certain waste categories like cloth materials and organic waste exhibited statistically significant differences, the majority showed no significant variance between Aba and Umuahia metropolises. These results suggest a general alignment in waste recycling practices among hotels in both locations. The findings support the acceptance of the null hypothesis, indicating no statistically significant difference in the extent of waste recycling practices between hotels in Aba and Umuahia metropolises. These insights underscore the need for coordinated efforts to promote sustainable waste management practices across urban areas. Chikwendu et al (2019) conducted a comparative study on solid waste composition and generation in selected hotels in Umuahia and Aba metropolis of Abia State, Nigeria. Their findings emphasized the need for waste sorting at source and highlighted the potential for waste reduction, reuse, and recycling. Similarly, Chaabane, Nassour, and Nelles (2018) examined key indicators for solid waste management systems in Tunisian hotels, emphasizing the importance of waste segregation and valorization.

From the analysis and test of hypothesis above, it was found out that hotels in Aba and Umuahia metropolis mostly recycle food wastes as shown with a mean score of 3.63 in Aba metropolis and 3.61 in Umuahia metropolis as well as 0.908 P-value for food waste recycling practices well above the 0.05 significance level for the test of hypothesis. On the other hand, hotels in the two metropolises engaged in limited recycling in other types of solid wastes. This is in line with Muthini, Tole and Otieno (2003) that conducted a study on solid wastes pollution loads in Beach hotels on the Kenyan South Coast. The study revealed that limited recycling, re-use and composting practices were undertaken by some of the hotels selected for study. Tins were re-used for planting tree seedlings and flowers. Glass waste and cartons were collected by dealers for recycling. Food waste was used to feed pigs. The results of the study made it possible to develop a feasible waste management concept for the hotels.

These selected hotels in Aba and Umuahia metropolis of Abia State were able to achieve limited recycling as interactions with some of them showed that food wastes were used majorly to feed

animals like pigs, dogs and other domestic animals to a reasonable extent while other solid wastes like wood was used for firewood especially for outdoor catering services and small building projects, containers were used for planting flowers especially in hotels that has gardens, organic wastes were used as manure by few while glass wastes were used by a few as addition to concrete blocks or to fortify security on their high fences. On the other hand, some of the respondents are not even aware of how the hotel wastes are being managed as this duty is delegated to cleaners. Further investigation shows that these hotel cleaners in Aba and Umuahia metropolises sell some of the solid wastes like plastics, glass and metals wastes to primary waste collectors who sell to scrap buyers that finally sell to recycling companies. The outcome or end product of this process is unknown to these hotels since the primary aim of these cleaners are to generate a little revenue from the sale of these solid wastes. This may defy the purpose of recycling which according to Achilias (2012) reveals that the major driving force in recycling projects is not only to reuse the material but to produce secondary value-added products. This is where the diffusion of innovative theory will play out its relevance.

Previous studies from the likes of Pharm Phu, Hoang and Fujiwara (2018) on waste management practices of the hotel industry in Hoi An Vietnam revealed that hotels in Hoi-An utilized 39% of its solid wastes for recycling, 29% for reduction and 0.8% for composting. Chaabane, Nassour and Nelles (2018) that studied on solid waste management; key indicator development for hotels found out that a minimum of 36% of the solid wastes generated by hotels could be valorized and recycled, if proper sorting at the source in hotels was performed to separate glass, metal, and mainly plastics and papers, which represent 22% of the total waste. According to Mohan, Deepak and Mona (2017), 30% of a hotel' s solid waste can be sorted, reused, recycled or recovered but most hotels, especially in Abia State, Nigeria, lack awareness about recycling as confirmed by Adamu, et al.(2014); Agunwamba, (1998); Agwu, (2012); as well as Ezeah and Roberts, (2012).

IMPLICATION TO RESEARCH AND PRACTICE

The research contributes empirical studies on the recycling practices of hotels in Abia State. By highlighting the similarities and differences in recycling behaviours and attitudes between Aba and Umuahia metropolises, the study underscores the importance of targeted interventions to enhance recycling efforts. It reveals specific areas, such as plastic waste management and the utilization of glass waste, where focused strategies can make a significant impact. This contribution is crucial for developing targeted educational campaigns and sustainability initiatives that can improve recycling rates of hotels in urban cities.

CONCLUSION

Recycling is a 21st century practice that encourages sustainable green practices. Utilization of hotel solid wastes to form secondary products through recycling by professional recyclers or for the purpose of reuse can help to reduce environmental pollution, landfill problems, and degradation

as well as increase customer base by retaining existing customers and attracting new customers while creating innovation in the hotel industry. Hotels are therefore advised to fully engage in unlimited recycling especially with these solid wastes that are merely discarded or sold to scrap and waste buyers. Given the overall similarity in recycling practices of hotels, with exceptions in cloth materials and organic waste, tailored recycling programs should be developed. For cloth materials, hotels can partner with textile recycling companies to repurpose old linens and fabrics. For organic waste, composting programs can be established to convert waste into useful byproducts, such as fertilizers for local gardens or hotel landscaping.

FUTURE RESEARCH

Future research can be conducted to ascertain the extent of hotel recycling practices of liquid wastes in Nigerian urban cities and other developing countries around the world.

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