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Influence of Resources and Training on Solid Waste Management Practices at Hotels in Zanzibar

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Abstract: This study examined the influence of resources and employees training on waste management among tourist hotels in Unguja, Zanzibar, using the Resource-Based View theory and waste management hierarchy framework. Data was collected from 130 hotels across five zones through a questionnaire. The study revealed significant differences between hotels that practiced waste reduction and recycling and those that did not. The study concludes that the number of permanent employees is crucial in adopting waste management. Among other recommendations, hotels that do not implement waste reduction and recycling practices should start doing so to attain the potential environmental and operational benefits. The hotels should also maintain permanent staffing with specialized training to realize efficiency.

Keyword: Waste management; waste hierarchy; resources based-view; waste management trainings; tourists' hotels.

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Introduction

In Africa, not only is there an upward trajectory in per capita solid waste generation, as noted by Ziraba et al. (2016), but it is also crucial to recognize that less than 30% of the generated solid waste in developing countries is appropriately managed. Zanzibar aligns with this pattern. The unprecedented growth of the tourism industry in Zanzibar has

brought about an enormous increase in waste generation (Mussa et al.,2021). The waste generation, if not properly managed, can pose serious health and environmental problems emanating from polluted water, soil and air. Waste has major impact on human health, especially for those who live near disposal sites (Ziraba et al., 2016; UNEP, 2013).

Additionally, mismanaged waste causes clogging of rivers and drainages, which causes floods and also pollute the ocean. Stagnant water becomes a breeding ground for mosquitos and other disease carrying insects as well as water borne diseases (Sandra & Weghmann, 2019). For instance, Giusti (2009) highlighted numerous epidemiological studies indicating the potential for illnesses associated with the proximity of waste facilities to both employees and residents in the vicinity. Therefore, ensuring effective waste management is crucial for promoting a sustainable environment and safeguarding public health.

In an effort to improve waste management in Zanzibar, this study examined the extent to which resources and hotel employees' training influence waste management practices, particularly solid waste among tourist hotels in Zanzibar, using the hierarchy framework and resource-based view perspectives, as detailed in the theoretical review section of the literature below.

Literature Review

The purpose of this literature review is to provide a comprehensive understanding of waste management in the tourism sector, with a focus on small Islands, particularly in Zanzibar. It begins by examining the unique dynamics and waste challenges faced by small island destinations, followed by an analysis of waste management in Zanzibar's tourism industry. The review also introduces the study's theoretical foundation and conceptual framework, concluding with the identification of hypothesized relationships that form the basis for empirical testing and analysis.

Tourism in Small Islands

Tourism plays a crucial role in the economic wellbeing of some small islands. Small islands rely on tourism for their economic wellbeing. Tourism for these islands brings in the much needed foreign and local currencies, which is the main source of income and employment for local populations (Pratt, 2015), playing a significant role in the development of the islands. It is an essential component of their economic development (Sharpley & Ussi, 2014).

Consequently, the high volume of tourism activities on small islands often leads to elevated per capita waste generation rates high per capita waste generation rates are common on small-islands (Hoornweg & Bhada-Tata, 2012). Their geographic isolation context is a great challenge in ensuring sustainable solid waste management. Additionally, they do not practice waste reduction since they largely depend on imported goods from outside the islands, due to limitations of financial resources, non-availability of land and inability to manage waste produced on the islands (Wang et al., 2021).

Evidently, the hotel industry contributes greatly to generation of wet waste (e.g., garden waste, food waste, cooking oil waste) and solid waste (e.g., cans/metal, plastics, linen, paper, other garbage) (Han et al., 2018). A study in Mallorca, Spain by Arbulu et al. (2016) found that 1% increase in tourist arrival growth rate resulted in an increase of 1.25% of waste disposal, 1% increase in tourist expenditures and 0.51% increase in municipal solid waste generation. Large amounts of solid wastes from the hotels and restaurants often end up in a landfill. A study by Chaabane et al. (2018) in Tunisia revealed that 83% of hotels collect mixed waste, which is thereafter transported to landfills. In the country, only 17% of the hotels developed small recycling and composting initiatives. In light of these challenges, addressing waste management in the tourism sector is crucial for ensuring the environmental and economic sustainability of small island destinations.

Tourism in Zanzibar

Tourism constitutes a key focus area within Zanzibar's blue economy development policy (Hafidh & Mkuya, 2021). The tourism sector in Zanzibar has attracted large amounts of investment and rapid expansion of hotels and international tourism (Lange, 2015). Registered number of hotels and guest houses increased from 452 in 2016 to 620 in 2020 (OCGSoZ, 2021). The increase in the number of hotels has contributed to the annual increase of the number of travelers each year. The islands registered an increase in the number of international visitors from 294,243 in 2016 to 538,264 in 2019 (BOT, 2019) and 548,503 in 2022 (ZCT, 2022). While room occupancy largely depends on the season, the low season is between March

and June, during which the average room occupancy decreases by 35% compared to high season, where the average room occupancy is 77% and the annual rate is 56% (Sharpley & Ussi, 2014).

Zanzibar produces large amounts of waste annually. It is estimated that the islands generate 92,000 metric tons of solid waste a year (Blomstrand & Hagström 2014). About 30% of these wastes are handled by the local government authority, while the remaining 70% is randomly disposed of on streets, beaches and green area. Most types of solid wastes produced in Zanzibar are organic in nature. The high organic content in waste stream is influenced by living standards and food habits of the local communities who largely depend on raw and unprocessed foods such as fresh fruits, vegetables and other agricultural products (Ally et al., 2014). The growth of the tourism industry has led to an enormous increase in waste generation, which has shifted from organic materials to recyclables and hazardous waste derived from large waste generated by the tourism industry (Mussa et al., 2021).

Theoretical Underpinning

Resources, both financial and human influence environmental management practices adopted by hotels in various ways. For example, lack of resources and high costs were cited by Mensah (2020) and Sánchez-Medina et al. (2016) as the most common barriers to effective environmental and waste management in hotels. A study by Sucheran (2018) on small and medium hotels in Kwazul Natal in the Republic of South Africa revealed that lack of resources was a major barrier to effective implementation of sustainable environmental management practices in small and medium sized hotels.

One of the influencing factors of sustainable waste management in hotels include resources possessed by hotels. Thus, the Resource Based View (RBV) theory informs resources related issues of hotels in this study. Variables used by this study are anchored in the RBV theory. The RBV theory explains the potential of hotels to utilize their resources to engage in sustainable practices of solid waste management processes (Hossain et al., 2022).

The RBV theory proves effective in examining resource interdependencies within organizations, as noted by Xia et al. (2018) and De Man and Luvison (2019). Widely employed to elucidate organizational performance concerning internal resources, capabilities and competences, RBV finds application in studies by Rockwell (2019), Nason and Wiklund (2018) and Dyer et al. (2020). Belgraver and Verwaal (2018) notably categorized resources into physical capital (machines, plants, capital), human capital (experience, knowledge, expertise) and organizational capital (planning and coordination mechanisms).

The argument posits that variations in the endowment of organizational resources elucidate the organizational performance (Das & Teng, 2019). Consequently, for hotels to excel in solid waste management, it is imperative that the resources and capabilities of well-trained employees, who must possess exceptional qualifications, are deemed valuable within these establishments (Xia et al., 2018; Rockwell, 2019; Dyer et al., 2020).

Specifically, in the context of Zanzibar and particularly in this study, the underlying assumption of the RBV is that performance of the hotel sector in terms of solid waste management processes is influenced by availability of financial and human resources, and employees' competencies and capabilities developed through training to expose employees to sustainable solid waste management practices in hotels (Alaaraj et al., 2018; Mensah, 2020).

Hierarchy of Waste Management

The waste hierarchy is a prescriptive model articulated to classify the desirability of different waste management approaches according to their environmental impact (Hultman & Corvellec, 2012). It was first adopted in the 1970s, when disposal-based waste management was criticized by the environmental movement and by the environmental advocacy groups because that method was considered unsustainable (Shamshiry et al., 2015).

The hierarchy indicates an order of preference for action to reduce and manage waste, and is usually presented as an inverted pyramid because the essential thrust of policy is to take action. When waste is created, the priority is to determine how much of it can be reused, recycled, recovered and/or sent for final disposal in a landfill (Shamshiry et al., 2015). According to the hierarchy model, the ultimate goal of waste management is to reduce the amount of waste disposed of at landfill sites (Mensah, 2020). In this regard, at the top of the hierarchy is waste prevention (UNEP, 2013). Prevention is the most desirable aspect in any waste management practice. It involves design, production

and consumption practices that do not result in the creation of waste (Hultman & Corvellec, 2012). In other words, prevention in context of waste management is the process of elimination of waste before it is actually created (Radwan et al., 2010). However, prevention or total elimination of waste by radical process changes is usually an unrealistic expectation (Bates & Phillips, 1999).

Reducing waste is the most effective way to alleviate pressure on disposal system by minimizing the amount of waste generated (Heimlich et al 2007). Radwan et al. (2010) termed this stage as minimization and defined it as reduction of waste during the life cycle of the product. The second most desirable practice is the reuse of products. This involves putting objects back into use so they do not enter the waste stream (Bates & Phillips, 1999). The third stage is recycling and composting of materials. This step is more explicitly about material transformations through disassembly, sorting and circulation to allow waste to re-enter industrial and biological production processes. The fourth stage is concerned with material transformation in the form of incineration of materials combined with recovery of energy contents of material for electricity and heat production (Hultman & Corvellec, 2012).

The final stage in the hierarchy is the disposal stage, either in landfills or through incineration without energy recovery (Bates & Phillips, 1999). This is the last resort for waste, which could not be prevented, diverted or recovered in the preceding steps (UNEP, 2013). Of all the stages described above, this is the least attractive stage in the sustainable waste management processes. Incineration is the less desirable option but is preferred to landfilling (Dahlströma et al., 2004). Landfills resulting from wastes from small hotels contribute to environmental degradation and pollution of groundwater through the creation of leachate and emission of explosive gases and greenhouse gases like methane (Giusti, 2009). However, even though landfill is considered the worst waste management option by some scholars, it is one of the stages that is widely practiced in waste management (Hultman & Corvellec, 2012).

Framework Used for Analysis

The waste management hierarchy is a widely accepted tool used in the evaluation of the solid waste management processes (Apaydin & Gül-Sümeyra, 2023). It is interpreted and applied in waste management policies in different practical ways. Thus, the hierarchy has many published versions, but mostly they all present the same message. This study adopted the waste management hierarchy version with five stages in Figure 1: reduction, reuse, recycling and compositing, incineration and landfill (Bates & Phillips, 1999; Dahlströma et al., 2004; Heimlich et al., 2007; Yuan & Shen, 2011).

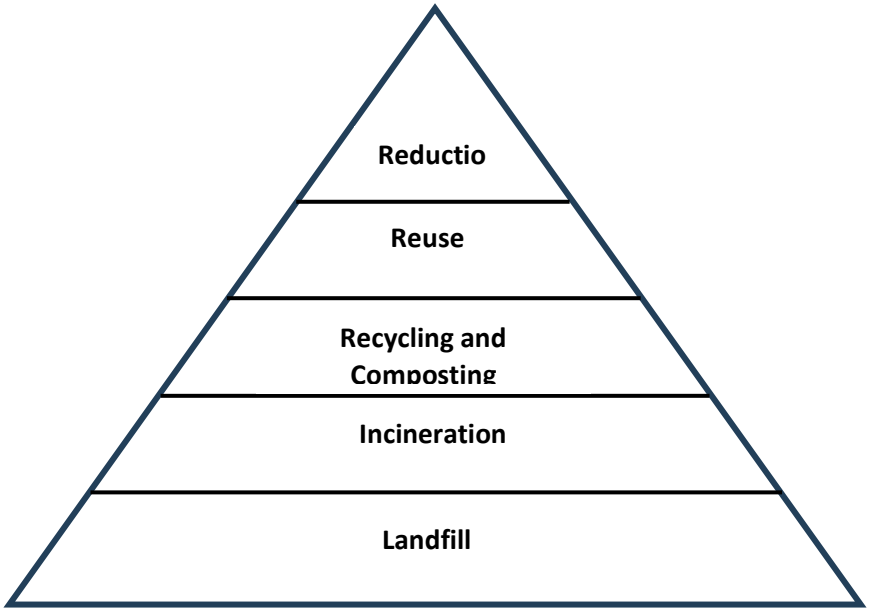

Figure 1: Hierarchy of Integrated Solid Waste Management

In order for hotels to achieve zero wastes, Radwan et al. (2010) recommended adaptation of the waste hierarchy that includes aspects such as prevention, reduction, reuse, recycle, compost and landfill. However, hotels adopt various practices along the hierarchy based on various factors such as size, resources availability, management style, etc. Studies have shown that the size of the hotels influences the environmental management practices it adopts (Wickramasinghe, 2016 & Segarra-Oña, et al. 2012). As reported by Webster (2000), many small hotel firms take little action to reduce the impact of waste they generate. Thus, they are more likely to adopt low level solid waste management practices, such as landfilling and incineration.

A study by Sánchez-Medina et al. (2016) in Oaxaca (Mexico) revealed that it was relatively easy for larger hotels to implement environmental management practices than for smaller hotels. A study by Dief and Font (2012) identified determinants of adoption of environmental practices among Red Sea hotels in Egypt. The study revealed that star rating and firm size influence the adoption of environmental management practices. This study further pointed out that environmental investment is worth the long-term reduction in operating costs, which are relatively high as hotel size increases.

A number of small hotels tend to prefer the least expensive solid waste management practices such as landfill disposal. According to Radwan et al. (2012), small hotels frequently choose landfilling as their primary waste management practice. A study on solid wastes management among the Welsh hotels by Radwan et al. (2010) found that small hotel operators use landfills as the main waste disposal method. However, within the realm of sustainable waste management practices, this approach is recognized as the least desirable.

The least practiced measures implemented by hotels are recycling and/or composting. Lack of recycling facilities for things like little shampoo bottles and the cold blast of the air conditioner contribute to its environmental inefficiency (Kasim, 2009). According to Radwan et al. (2010), hotels often consider composting to be costly, or they may lack the technology to perform such operations. A study by Omune et al. (2021) revealed that composting organic waste was the least implemented waste management practice by hotels in Kenya. In a study on solid waste management by hotels in Tunisia, Chaabane et al. (2018) found that 83% of hotels generated mixed waste which is disposed to the landfills, whereas only 17% of the hotels had initiated small recycling and composting initiatives.

Based on the above literature and the RBV theoretical support, this study investigated the influence of resources (financial and human) and employee training on the adoption of various solid waste management practices, in Zanzibar.

Conceptual Framework

Based on the theoretical foundation, Figure 2 demonstrates the pictorial relationship of resources, employees training and waste management practices in Zanzibar.

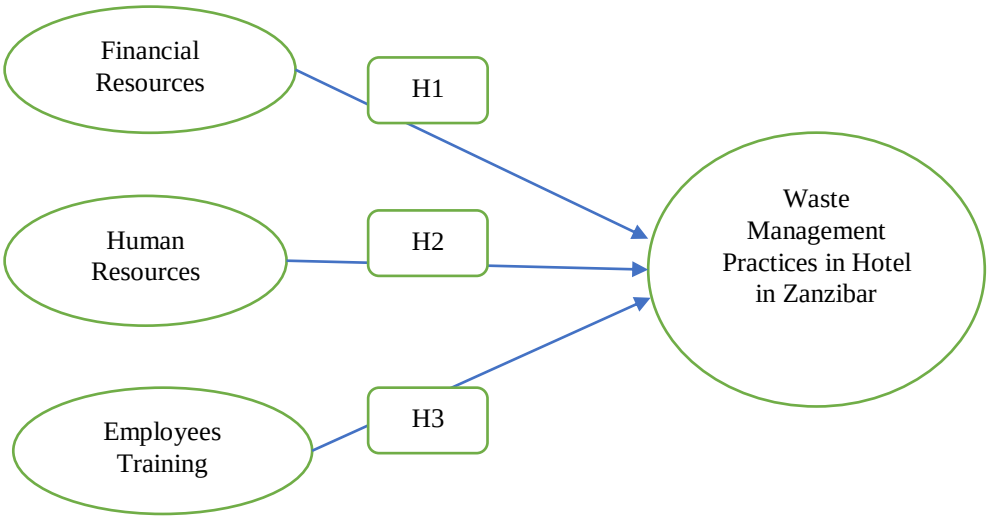

Figure 2: Hypothesized Influence of Resources and Employees Training on Solid Waste Management

The following three hypotheses guided this inquiry, drawn from the conceptualization of the research model in Figure 2.

H1: Financial resources are associated with the waste management practices, according to the waste management hierarchy of hotels in Zanzibar.

H2: Human resources in terms of availability of permanent and seasonal employees are associated with the waste management practices based on the waste management hierarchy on hotels in Zanzibar

H3: Employees' training is associated with the waste management practices according to waste management hierarchy on hotels in Zanzibar

Methodology

The methodology sections offers an overview of the research methodology, outlining the study area, data collection methods, population and sampling techniques, procedures and analysis used in the study.

Study Area

Zanzibar archipelago consists of two main islands of Unguja and Pemba and 52 islets. The islands cover a total area of around 2,654 km^2 out of which Unguja Island occupies the area of 1,666 km^2 and Pemba Island occupies the remaining 988 km^2 of the total area (OCGSoZ, 2021). The islands' population was 1,889,773 based on the population census of 2022 (NBS, 2022). This study was conducted in Unguja, the largest island of the Zanzibar archipelago. Unguja was an ideal place for the study because tourism activity is primarily centered in the Islands (Sharpley & Ussi, 2014). Data was collected from tourist hotels located in five zones of the islands; Central, Urban, North, East and West Zones.

Data Collection Method

Data was collected, using a self-administered structured questionnaire. The questionnaires contained close-ended questions relating to solid waste management practices of the hotels in Zanzibar. The survey questionnaire was distributed to hotel managers or competent hoteliers at management levels. The respondents were asked various questions in relation to solid waste management in their hotels. For example, information was requested on current SWM practices, including barriers to SWM practices, features of SWM facilities, type and level of SWM services of the hotels, external handling of solid waste, solid waste types, stakeholder relations, handling of waste particularly the implementation of waste separation at the source, reduction, recycling and composting in their hotels.

Population and Sampling

The population and sampling frame of the study comprised of the list of all 484 hotels in Zanzibar (ZCT 2019). Respondents in the hotels were the managers or competent individuals identified by the hotels. The hotels sizes ranged from small to extra-large, depending on the number of rooms and beds. A total of 243 hotels were included in the study sample (half of the population). The study employed random sampling techniques to obtain hotels that were involved in this study. Once the hotel was selected, the hotel manager or competent hotelier at management level were contacted for the survey questionnaire distribution and processes. Survey questionnaire sheets, 158 in numbers, were distributed and retrieved. Of those, 130 were clean and complete for use.

Data Collection Procedures and Analysis

A pre-test was conducted in four hotels in Central Urban Zone of Zanzibar. The pre-test was conducted to determine issues relating to respondents' comprehension, burden and interest. A major finding from the pre-test was the need to translate the questionnaire in Kiswahili to enable Kiswahili speakers to comprehend and answer the questionnaire. The questionnaire allowed both English and Swahili speakers to respond to the survey. Actual data collection was done by twenty research assistants, trained by the researchers prior to the main survey. Data was collected in December 2019, just before the outbreak of the Covid-19 pandemic. To ensure a higher response rate, research assistants made personal calls to hotel managers before visiting the hotels in person to distribute the questionnaire. In case the hotel managers were unavailable, the questionnaire sheets were left with the understanding that the filled out questionnaire sheets would be collected at an agreed upon future dates. Data collected was cleaned and analyzed quantitatively using the IBM SPSS Statistics (version 27).

Findings and Discussion

The major issue in this study was to what extent resources and employees' training influence waste management practices in hotels on Zanzibar. Before presenting the tested hypotheses to answer this broad research question, this section summarizes respondents' profiles and hotel characteristics,

highlights waste collection practices and dumping site locations and concludes with hypothesis analysis.

Respondents' Profile and Hotel Characteristics

A majority of the respondents (68%) who participated in this study were Directors or Managers of the hotels. A bigger portion of the respondents aged between 31 and 40 years old (37%). The aged between 21 and 30 years old range constituted 28% and the age range of between 41 and 50 years old constituted 22%. More than a quarter of the respondents (36%) had a good experience of hotels, having worked there for 36 months or more. In terms of the hotel size and location of the 130 hotels located in Unguja, 46.2% were in the micro hotels category, followed by small hotels (29.2%) (Table 1). Most hotels (59.3%) involved in the study were located in the North (33.1%) while (26.2%) were located in the South Sone. The two zones were ideal because most of the hotels and guest houses in Zanzibar are located in these areas.

Table 1: Hotel size and Location of Study Hotels in Zanzibar

	Category	Frequency	Percent (%)
Position in the Hotel	Managers	86	66
	HR	18	14
	Owner	15	12
	Director	3	2
	Financial controller	2	2
	Others	6	5
Age	21 – 30	36	28
	31 – 40	48	37
	41 – 50	28	22
	51 – 60	15	12
	61 or above	3	2
Years of employment in the hotel	Less than one year	19	15
	1-3 Years	64	49
	3-6 years	22	17
	6 - 9 Years	7	5
	Above 9 years	18	14
Hotel size	Micro	60	46.2
	Small	38	29.2
	Medium	13	10
	Large	8	6.2
	Extra large	11	8.5
Location	Central	16	12.3
	Urban	27	20.8
	North	43	33.1
	South	34	26.2
	West	10	7.7

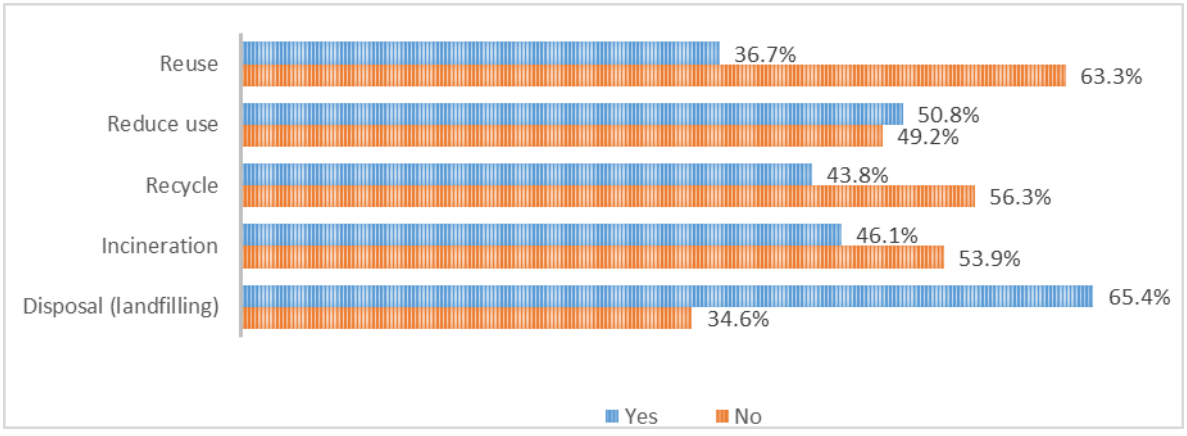

Figure 3: Solid wastes management practices in Zanzibar

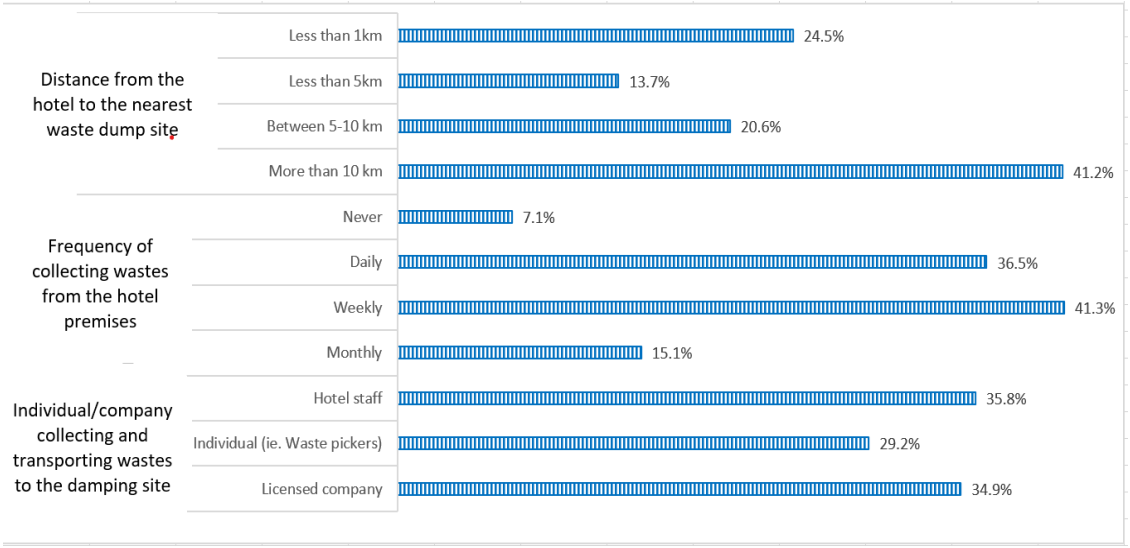

Figure 4: Collection of Waste from Hotels and Location of Dumping Sites

Common Waste Management Practices in Hotels on Zanzibar

As noted earlier in the preamble of this section, before testing the hypotheses, it was important to highlight common waste management practices of hotels in Zanzibar. Among these, disposal through landfilling was the most widely used method, adopted by 65.4% of hotels (Figure 3). The second common practice was waste reduction, implemented by 50.8% of the hotels, followed by incineration at 46.1%. Reuse was the least adopted method, with only 36.7% of hotels employing it.

While the widely adopted practice is disposal (landfilling), most hotels (35.8%) used their hotel staff, (34.9%) used licensed companies and (29.2%) used individuals to collect and transport solid wastes from the hotel premises to the dumping sites. Waste is mostly collected on a weekly basis (41.2%) or daily (36.5%) and transported from hotel premises to dumping sites most of which are located more than 10 km from the hotels (Figure 4).

Similar to the findings of this study, other studies also found that the landfilling practice is common in most hotels in third world countries Mensah, 2020). It is considered cheaper than other methods. Landfilling is the least favored waste management option under the waste management hierarchy model since it has the most impact on the environment. Ironically, that is the commonest waste management practice used in small hotels (Radwan et al., 2010). In addition, in line with the findings of this study, research shows that waste disposal sites in tourism intensive areas are typically located at a significant distance from hotels to minimize environmental and health impacts on tourism activities. Similarly, other scholars found that the removal of solid waste from hotels is generally managed by either hotel staff or licensed waste management companies, with collection occurring on a daily or weekly bases, depending on the volume and type of waste generated (Radwan et al., 2010).

Waste Management and Resources & Training

The following hypothesized relationships on financial resources, human resources and employees training were developed:

H1: Financial resources are associated with the waste management practices according to the waste management hierarchy of hotels in Zanzibar.

H2: Human resources in terms of availability of permanent and seasonal employees are associated with the waste management practices based on the waste management hierarchy on hotels in Zanzibar.

H3: Employees training is associated with the waste management practices according to waste management hierarchy on hotels in Zanzibar.

This section presents the findings and discussion on the tested hypothesized relationships involving financial resources, reflected by annual sales turnover as well as human resources including permanent and seasonal human resources and employees training.

Financial Resources and Waste Management

To address the hypothesized relationship concerning the influence of financial resources on

solid waste management in Zanzibar, it was assumed that annual sales turnover is a clear indication among others of the financial capacity of the hotel particularly in managing solid wastes sustainably. Thus, a t-test was conducted to assess mean differences between hotels that practiced various solid waste management practices and those that did not (Table 2). Statistically significant difference was observed between the hotels that often practiced 'Reduce use' and those which did not practice it often (t = 1.294, p = 0.015). Additionally, significant difference was observed between hotels that practiced recycling of any of the wastes generated in the hotels and those that do not (t = 1.284, p = 0.012).

Table 2 shows that higher annual sale turnover significantly influenced some aspects of the adoption of waste reduction and recycling practices. This trend aligns with Sánchez-Medina et al. (2016), who found that firms with better financial performance are more likely to incorporate sustainability due to their ability to manage costs. Similarly, Dief and Font (2012) reported that larger, financially stronger hotels are better equipped to implement environmental management systems. Radwan et al. (2010) also observed that smaller hotels, limited by resources, are less likely to adopt sustainable practices, reinforcing the link between sales turnover and sustainable waste management efforts.

Table 2: Differences in Annual Sales Turnover (USD) and Strategies for Waste Management

		Mean	SD	F	T	p-value
Reduce use	Yes	4,920,957	14,945,098.1	6.5	1.294	0.015**
	No	63,012	152,385.5			
Reuse	Yes	3,922,085	14,955,970.2	0.661	0.36	0.421
	No	2,546,143	9,887,423.2			
Recycle	Yes	5,000,609	15,247,316.9	6.9	1.284	0.012**
	No	231,638	721,175.4			
Incineration	Yes	2,376,524	11,753,682.2	0.349	-0.477	0.558
	No	4,197,716	12,467,072.0			
Disposal (landfilling)	Yes	163,100	207,681.7	1.953	-0.703	0.170
	No	3,651,753	13,000,838.7			

**Significant at p < 0.01, **significant at p < 0.05, ***significant at p < 0.1*

Table 3: Number of Permanent Human Resources and Waste Management in Hotels

		Mean	SD	F	T	p-value
Recycle	Yes	50	85.4	7.1	1.505	0.010**
	No	26	45.0			
Reduce use	Yes	47	83.7	6.2	1.268	0.015**
	No	27	43.8			
Reuse	Yes	31	50.0	1.667	-0.604	0.201
	No	42	78.2			
Incineration	Yes	14	18.4	31.713	-3.104	0.000*
	No	63	90.5			
Disposal (landfilling)	Yes	21	19.7	3.665	-0.901	0.060***
	No	*40*	*73.6*			

*Significant at p < 0.01, **significant at p < 0.05, ***significant at p < 0.1

On the other hand, the number of seasonal employees had a statistical significant influence on some aspects of recycling practices in the hotels (t = 1.355, p = 0.030), whereby hotels with an average large number of seasonal employees tend to recycle more than those with an average small number of seasonal employees. Number of seasonal

employees had slight influence on reuse and incineration (Table 4).

The number of seasonal employees was found to have no influence on most types of solid waste management practices adopted by the hotels except recycling. Seasonal employees play a pivotal role in waste management practices, influencing both the effectiveness and sustainability of these efforts. However, their short-term involvement can lead to inconsistent waste management practices, impacting overall sustainability efforts. Studies suggest that the high turnover rate among seasonal workers can disrupt waste management protocols and reduce the effectiveness of sustainable waste strategies (Williams et al., 2020). Zientara and Bohdanowicz (2020) further argues that the short-term involvement of seasonal staff often results in limited environmental training, reducing their ability to effectively contribute to sustainable waste management strategies.

Table 4: Number of Seasonal Human Resources and Waste Management

		Mean	SD	F	T	p- value
Reduce use	Yes	39	70.7	1.5	-0.872	0.218
	No	53	80.6			
Reuse	Yes	37	63.0	3.559	-0.942	0.063
	No	52	83.6			
Recycle	Yes	59	89.9	4.9	1.355	0.030**
	No	36	62.3			
Incineration	Yes	36	71.4	3.52	-1.239	0.064
	No	56	78.8			
Disposal (landfilling)	Yes	32	52.4	2.881	-0.777	0.093
	No	48	78.8			

*Significant at p < 0.01, **significant at p < 0.05, ***significant at p < 0.1

Table 5: Employees Training and Solid Waste Management Practices in Hotels

		Upon Employment	Monthly	Yearly	Never	χ 2	p-value
Reduce use	Yes	49.1 (26)	47.8 (11)	63.6(7)	45 (9)	1.071	0.784
	No	50.9 (27)	52.2 (12)	36.4 (4)	55 (11)		
Reuse	Yes	37.7 (20)	39.1 (9)	54.5 (6)	30 (6)	1.825	0.609
	No	62.3 (33)	60.9 (14)	45.5 (5)	70 (14)		
Recycle	Yes	39.6(21)	47.8(11)	63.6(7)	40(8)	2.401	0.494
	No	60.4 (32)	52.2 (12)	36.4 (4)	60 (12)		
Incineration	Yes	50.9 (27)	39.1 (9)	45.5 (5)	40 (8)	1.249	0.741
	No	49.1 (26)	60.9 (14)	54.5 (6)	60 (12)		
Disposal (landfilling)	Yes	22.2 (12)	17.4 (4)	18.2 (2)	10 (2)	1.249	0.741
	No	77.8 (42)	82.6 (19)	81.8 (9)	90(18)		

*Significant at p < 0.01, **significant at p < 0.05, ***significant at p < 0.1

Employees Training and Waste Management

In Table 5, training of employees was found to have no influence on adoption of solid waste practices since no significant values were found among all the solid waste management practices. Table 5 shows the empirical results.

Employees' training had no significant influence on the type of solid waste management practices adopted by hotels in Zanzibar. These findings are contrary to the findings by Mbise and Mlozi (2019) who found that employees' training has a significant influence on environment management practices of hotels on mainland Tanzania and particularly hotels in the touristic cities of Arusha and Dar es Salaam.

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Conclusions and Recommendations

In conclusion, the study revealed significant differences between hotels that regularly practiced waste reduction and recycling and those that did not, suggesting positive impact of such initiatives on sustainability in the tourism industry. The number of permanent employees is shown to be crucial in adopting waste management practices, particularly in recycling, incineration and waste reduction, highlighting the importance of stable staffing. Additionally, the number of seasonal employees influenced recycling practices, with hotels employing more seasonal workers being more likely to implement recycling initiatives.

It is therefore recommended that hotels that do not consistently implement waste reduction and recycling practices should prioritize these initiatives as the initiatives offer clear environmental and operational benefits. Adequate permanent staffing levels should be maintained to support the practices, with specialized training on sustainable waste management to improve efficiency across the sector. Hotels should leverage their seasonal workforce by providing targeted recycling training and involving them in other waste management practices like reduce, reuse and incineration. Finally, integrating training with such strategies as financial incentives or structural changes can strengthen sustainability efforts. Tailored training programs on hotel employees, waste management personnel and local government staff are essential along with curriculum updates that include sustainable waste management in tourism and hospitality education, particularly at the State University of Zanzibar, to prepare future professionals for sustainability challenges.

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