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Moderating Effect of Hotel Star-Rating on Green Solid Waste Practices and Sustainability of Hotel's Solid Waste Disposal in Nakuru County, Kenya

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ABSTRACT

The growth of the hospitality industry coupled with rapid population growth, urbanization and weak institutions and poor governance have undermined efforts to mitigate resultant negative environmental impacts. The general objective of this study was to examine the moderating effect of hotel star-rating on the relationship between green solid waste management practices and sustainability of hotels in solid waste disposal in Nakuru County, Kenya. The research used a cross-sectional mixed-methods survey design and targeted 259 hotels in Nakuru County. A sample size of 204 hotels was determined using Krejcie and Morgan formulae. Stratified random sampling was used for selecting hotel managers for the survey while purposive sampling was used for selecting the key informant interviewees. The data collection tools used in the study were a semi-structured questionnaire and in-depth interviews guide. A binary logistic regression model was used to evaluate the moderating effect of hotel star-rating on relationship between green waste management practices and sustainability in solid waste management in the hotel industry in Nakuru County. Results showed that hotel size, policies, staff capacity, and market access influence sustainable waste practices. A majority (94.1%) of Nakuru hotels are non-star rated, with only 5.9% star-rated, mainly 3-star (50%). Hotel star-rating did not significantly moderate the relationship between green solid waste practices and sustainability, with a marginal effect of -0.038 (p = 0.734). Star-rated hotels showed a slight, non-significant decrease in adopting sustainable waste practices, indicating star rating is not a key determinant of sustainability in Nakuru hotels. Star rating does not strongly influence the relationship between green waste practices and sustainability of hotel waste disposal practices. The study recommends that hotels should integrate green waste management into star ratings, develop policies, and train staff. Higher-star hotels should invest in advanced solutions while lower-star hotels adopt low-cost practices.

Keywords: Green practices, solid waste, solid waste management, star-rating, hotel, solid waste

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disposal

1. INTRODUCTION

Solid waste generation is a major global sustainability issue. It is estimated that 2.24 billion tons of solid waste were generated globally in 2020 and projections are made that solid waste generation will increase by 73% from 2020 to 2050 with estimated 3.88 billion tons in 2050 (World Bank, 2022). Municipal waste generated by hospitality industry has become a significant sustainability challenge. It is estimated that tourism sector generates about 35 million tons of solid waste annually (Juvan et al., 2023). Many countries are heavily depend on landfills for solid waste disposal. The largest landfill is in Las Vegas, United States, with a geographical space of approximately 2,200 acres, followed by Bordo Poniente in Mexico with a landfill of about 927 acres, and the third largest landfill is in China with approximately 830 acres.

In developing countries, Sao Jao landfill in Brazil is the largest with approximately 150 acres, Guatemala City dump in being the second largest with 40 acres and Dandora dumpsite in Kenya is third, with 30acres (Emmanouil et al., 2022). Developing countries face challenges of solid waste management as it is estimated that over 90% of solid waste generated is disposed in dumpsites or burnt (World Bank, 2022). In Nakuru County, the most prominent dumpsites are Gioto in Nakuru City and Kayole in Naivasha. Approximately 124,898.4 tons of solid waste are collected annually for disposal at Gioto dumpsite.

Organic waste is the most common type of waste produced, which accounts for 1,439.4kg (56.9%) and is mainly generated at home level and in food/agricultural markets, restaurants and hotels (Nakuru County Government, 2019). The solid waste is often collected by private and public collectors for disposal in the dumpsites resulting to unsustainable solid waste disposal practices. The volumes of solid waste dumped are increasingly filling up the dumpsite creating a dire situation. It is estimated that 124,898.4 tons of solid waste are collected annually in Nakuru City for disposal at Gioto dumpsite. A majority (82%) of this solid waste is recyclable (Kiogora et al., 2022). The dumpsite is heavily contaminated with heavy metals. Increased demand for landfills limits land resources that would have otherwise been used for agricultural production reducing food production for the rapid urban population (Kariuki et al., 2020). In addition, the dumpsite has negative environmental related risks due to air pollution, emissions of harmful gases such as carbon dioxide, contamination heavy metals. this pose risks to health of the people living in the city and those adjacent to the dump sites due to environmental problems such as aesthetic loss and environmentally-health related problems such as respiratory illnesses and diarrhoea (Kariuki et al., 2020).

There were over 300 hotels registered by the Tourism Regulatory Authority in Nakuru in the

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year 2020 (Akinyi, 2021). These hotels have influenced the socio-economic growth of Nakuru town as growth in the number of hotels has influenced business owners to transform their rental houses into business premises. In addition, the hotels' growth has attracted tourists to Nakuru and promoted the various businesses such as market creation for local crafts (Juma & Vidra, 2019). The hotel industry in Nakuru is linked to Lake Nakuru National Park with tourists visiting the lake seeking accommodation in the hotels around the park (Avni, 2020). Approximately 200,000 visitors pay visits to Lake Nakuru every year contributing to the socio-economic development of the City of Nakuru and its surrounding area. However, the growth of these hotels is linked to environmental degradation (Agesa, Kamau, and Kivuva, 2022). Hotels major activities on offering accommodation and hospitality services translates to increased consumption of resources thus increasing volumes of solid waste for disposal. Hotels do not maximize the use of resources that they acquire from the external environment since there are minimal practices on waste reduction and waste composting. Increased wastage of resources increases the volumes of solid waste collected for disposal increasing their operating (Agesa et al., 2022).

The county and national governments have formulated policies on waste management with emphasis on the -reduce, reuse and recycle (3Rs). Nakuru county government has put in place legal frameworks to mitigate unsustainable solid waste management practices. These include environmental and conservation policy that promote green solid waste management practice policy based on reduce, reuse and recycle (3Rs) model (Ombis, 2017). Failure to segregate solid waste by commercial entities attracts a fine of approximately Ksh. 50,000 and below (Nakuru County Government, 2019). Despite policy formulation by Nakuru county government, there is very scanty empirical evidence on the extent to which green solid waste management practices are implemented by hotels in the county, how these practices shape the sustainability of hotel's solid disposal and factors that influence this relationship. This study aimed to fill these gaps by assessing the moderating effect of hotel star-rating on the relationship between hotel green solid waste practices and sustainability of hotel's solid waste disposal in Nakuru County, Kenya.

The investigation is fundamental in attainment of SDG 6 on clean water and sanitation, SDG 12 on responsible production and consumption, SDG 13 on climate action and problems related to emission of greenhouse gases. Hotels implementation of green solid waste management practices reduce their volumes of solid waste collected for disposal. Minimal volumes of solid waste translate to reduced solid waste contamination with ground water and surface water hence hotels contribution to attainment of SDG 6. Hotels implementation of green solid waste management practices on reuse and recycling helps sort solid waste used as raw materials in other industries, hence promoting industrial symbiosis and achievement of SDG 12. Hotels uptake of green solid waste management practices reduces their volumes of solid waste collected for disposal, thus

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reducing greenhouse related gases such as carbon dioxide and methane hence achievement of SDG 13.

The study promotes a circular economy. This economy goal is to have zero waste. Hotels implementation of green solid waste management practices of sorting solid waste for reuse and recycling enhances a circular economy. This waste is used as raw materials for production processing in other industries. The availability of market by processing industry for solid waste sorted for reuse and recycling increases demands for sorted solid waste for recycling, hence minimizing the volumes collected for disposal in the dumpsites. The study helps in attainment of Africa Union Agenda 2063 whose goal is attainment of a prosperous Africa, based on inclusive growth and sustainable development. The aim is to achieve environmentally sustainable and climate resilient economies, and sustainable consumption and production patterns. Hotels minimizing their resources input will ensure that consumption and production patterns are sustainable because there is minimization of excessive waste. Reduced uptake of resources reduces the volumes of solid waste collected for disposal and pollution hence achieving environmentally sustainable and climate resilient economies.

2. LITERATURE REVIEW

2.1 Green Solid Waste Management Practices and Sustainability of Hotel's Solid Waste Disposal

Sustainability of hotel's solid waste management can be conceptualized as one of the dimensions of hotel sustainability. Components of this sustainability include: frequency of collection of solid waste for disposal, costs associated with collection of solid waste for disposal, cost associated solid waste disposal fees at dumpsites and social and environmental costs associated with solid waste collection, transportation and disposal at dumpsites; noise pollution, social desirability inconveniences, carbon footprint and climate change (Chikezie et al., 2023; Giri, 2021).

Filimonau et al., (2021) who studied environmental and carbon footprint of hotels in Brazil and Peru revealed that hotels are significant contributors to global environmental footprint due to large consumption of energy and material resources in their mandate to provide goods and services to guests. Impact of high material and energy consumption by hotels results to environmental pollution linked to greenhouse gas emissions, water pollution, solid waste generation and pollution, and ozone layer depletion. Reduction of environmental footprint of hotels is important for sustainable development. Hotels are ranked amongst the top five energy consumer's sector. Increased energy consumption of energy in hotels translates to increased energy cost affecting the operational cost of hotels (Salem et al., 2020). To minimize hotels pollution and save on cost, it is necessary that hotels implement green solid waste management

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practices. Additionally, Mensah (2020) study on waste management practices of small hotels in Accra. The paper established that sustainable waste management practices; reuse, reduce, and recycling help reduce waste disposal cost, and environmental pollution. Useful materials are recovered and prevented from being burnt and from being collected for disposal. At the regional level, it is evident that hotel performance is affected because of high cost for solid waste collection and disposal. The cost of solid waste collection and disposal include the unnecessary time spent on waste handling, storage and clean up, and the expense related to disposal of materials that are not used as solid waste. These costs related to time and finances can drain on hotel resources (Giri, 2021).

Similarly, the authors Abdou et al., (2020) in their studies on green hotel practices and sustainable development in Egypt revealed that hotel sector is linked to huge consumption of water, energy, and other materials resulting to large amount of raw and solid waste. Improper management of this solid waste has negative impact on the environment and operating costs of hotels. Moreover, In Kenya, Omune et al., (2021) hotels are associated with excessive consumption of energy, water and other materials. Hotels contribute to 21% of greenhouse gas emissions and this is predicted to rise by 3.2% per year. Hotels releases approximately 160-200kg of carbon dioxide per square meter of the room floor area. The carbon emissions are predicted to increase by 170% by 2035. Hotels also consume about 1499 liters of water per day to support 14 people. Hotels use of material resources results to increased volumes and different types of solid waste produced. This increases hotels operational cost and also depletion of resources. It is evident that the hotels are facing sustainable solid waste disposal challenges related to operational cost. Failure to address these challenges related to sustainability of hotel's solid waste disposal of hotels might affect the growth of the hospitality industry, and as a result the hotel is not be able to contribute to the GDP of the nation and sustainable development. In addition, the hotel sector might not be able to create employment and it is a great world's employer.

Giri (2021) assessed the effect of integrated solid waste management in hotels in Nepal. The study adopted a qualitative approach since ethnographic research design was used. The results of the study revealed that the volumes of solid waste collected for disposal to the landfills has reduced. This reduction is attributed to the adoption of green solid waste management practices by small hotels in Nepal. The hotels segregated their solid waste for reuse where the kitchen waste separated is sold to animal farms as feeds. Additionally, hotels segregated their waste for recycling dry waste such as tetra pack and thermacol. However, this study was conducted in Nepal and the context is different from Kenya in terms of technologies for green solid waste management practices to Kenya. The study also used qualitative approach to describe the solid of waste management practices adopted in hotels in Nepal, thus was not able to show the

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relationship between the solid waste management practices adopted and sustainability of solid waste disposal. The current study used both the qualitative and quantitative approach to describe the green solid waste management practices adopted by hotels and the relationship between the green solid waste management practices and sustainability of hotels solid waste disposal.

Viachaslau and Tochukwu (2020) examined managerial approaches in mitigating solid waste in hotels in Nigeria. The results of the study revealed that hotels adoption of green solid waste management practices by recycling and reselling solid waste for reuse and recycling to street scavengers, help reduce the volumes of solid waste collected for disposal and costs associated with solid waste collection and disposal. The scavengers are allowed to take items such as plastics, iron and bottles from the bin for recycling or resell hence indirectly engaging hotels in recycling process. However, this study used qualitative approach to describe challenges faced in solid waste Management in hotels in Lagos, internal and external enablers and inhibitors of solid waste management and measures to be applied to facilitate effective solid waste management. The context of this study is different from that of Kenya where the current study was conducted and measures adopted to manage solid waste sustainably might be different. The study also did not highlight the relationship that exists between effective solid waste management practices and sustainability of hotels solid waste disposal in Lagos.

Moreover, Mensah (2020) assessed green solid waste management practices in hotels in Accra. The results of the study revealed that hotels has adopted green solid waste management practices such as green purchasing practices including purchasing recyclable materials helps reduce solid waste produced. The recyclable materials after use are separated so that they can be processed for reuse again, resulting to prevention of solid waste generation, ultimately reducing the volume of solid waste generated that requires collection and disposal to the dumpsite. However, this study targeted small hotels hence the green solid waste management practices implemented by medium, large and very large hotels were not described. The study did not indicate the relationship that exists between green solid waste management practices and hotel's sustainability in solid waste disposal.

More so, Kfouri et al., (2022) assessed sustainable solid waste management practices in restaurants in Brazil. The results revealed that restaurants adoption of sustainable solid waste management practices including solid waste segregation, reuse and recycling reduced volume of solid waste collected for disposal to the landfills by up to 90%. However, the study approach was qualitative where observations were used for data collection in the hotel that was used as a case for this study. The study was conducted in Brazil and the context is different from that of Kenya, hence sustainable solid waste management practices adopted by hotels in Kenya might be different. The study only described the sustainable solid waste management practices but did not show the relationship they had with hotels sustainable solid waste disposal.

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2.2 Hotel Star-Rating, Green Practices and Sustainability of Hotels Solid Waste Disposal

Hotel star-rating refer to the classification of hotels according to features like hotel size, facilities, employee training and services. Different hotels will produce different types of solid waste on basis of the services that they offer to their clientele and also the geographical location of the hotels. Hotels offering basic services such as food and accommodation, there is increased chances of producing food related waste, bottle waste and paper waste. Further, hotels offering basic services and other services such as capacity building, conferences, fitness services there are chances that they will produce more types of waste because of the additional services offered. Hence, this study found it important to assess the different types of solid waste produced by hotels in Nakuru County because of their uniqueness in their target clientele as well as services that they offered to their clientele.

Agyeiwaah (2020) assessed the role of small hotels in sustainable solid waste management in Ghana. The results of the study revealed that small hotels contributions to sustainable solid waste management practices involved practices that were economically viable and socially acceptable. The economic viable practices included waste minimization, reuse, sorting, feeding animals, and controlled disposal of waste. However, this study targeted small hotels in Ghana that are sensitive to implement sustainable solid waste practices that are economically viable. Medium, large and very large hotels might consider sustainable solid waste practices that are pricey because of their financial abilities.

Phu et al., (2018) analysed association of hotel size on green solid waste management practices in hotels in Vietnam. The results of the study revealed that there is an association between hotel size and green solid waste management practices; increase in hotel size increases their adoption of biodegradable waste and less proportion of recyclable waste. These suggest that hotel size affects association of green practices. It affects the adoption of green solid waste management practices. This study was conducted in South Asia where the country is more developed compared to Kenya and might have relatively big hotels with higher association with green solid waste management practices. Stackegård and Ivarsson (2022) assessed waste sorting management and sustainability in small scale hotels in Sri Lanka. The results of the study revealed that there are no written hotel policies on sustainable waste management practices by small hotels in Sri Lanka. This might suggest that there are low sustainable waste management practices due to lack of sustainability guidelines by hotels..

Abuelhassan and Elsayed (2020) assessed the impact of employee green training on hotel environmental performance in hotels in Egypt. The findings revealed that there is a positive and significant relationship between access to green trainings by hotel staff and hotels environmental performance ($\beta=0.43$, $p<0.01$). Access to green knowledge helps develop environmental

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knowledge and skills that are relevant in achieving green environmental performance. In a similar study, Langgat et al., (2023) examined employee trainings on green practices in hotels in Malaysia. The results of the study revealed that, there are generally significant trainings offered to hotels staff on green practices. Hotels training targeting employees including environmental awareness reported a mean of 3.85 (SD=0.88) and trainings on projects including environmental awareness reported a mean of 3.93 (SD=0.87). However, the study was predominantly for hotels located in urban areas where they can easily access training opportunities and experts on green practices.

Mulati and Juma (2019) assessed green trainings offered to hotel staff in star rated hotels in Kisumu City. The findings indicated that, there were relatively low green trainings to staff on enhanced environmental awareness in procurement process and improving their green skills during procurement with a mean of 3.34 (SD=1.01) and 3.30 (SD=1.01) respectively. The study was involved in the following aspects of green training: environmental awareness, green skills, potential for improvements, adoption of learning, environmental culture and on-job assessment. The study was conducted in Kisumu and geographical context is different from Nakuru county, thus need for examining staff green trainings in Nakuru County. Castiglioni et al. (2018) assessed solid waste generation in a hotel event service in Brazil. The results of the study revealed that organic matter waste was leading type of waste at 43.7% and the least waste produced was metal waste at 1.2%. these findings are consistent with the findings of Juvan et al. (2023) and Chikwendu et al., (2019) which revealed that organic waste is the leading type of waste in hotels. The possible explanation is that hotels major role is hospitality and hence increased organic waste production.

3. RESEARCH METHODOLOGY

The study adopted pragmatism research philosophy. The philosophy supports a mixed method approach; qualitative, quantitative, action research and emphasizes on practical solutions and outcomes (Bryman, 2016). This study used the cross-sectional mixed-methods design. This design was appropriate for the study because it allowed the researcher to examine many at the same time. Cross-sectional mixed method design allowed the collection of both quantitative and qualitative data. quantitative data was collected using survey questions and qualitative data was collected using key informants interview guide. The study was conducted within selected towns of Nakuru County. The target population for the study was 259 hotels (Nakuru County Tourism and Hospitality Department, 2021) within the selected towns (Nakuru town, Naivasha town, and Gilgil town) in Nakuru County. The hotels are distributed in three categories which include: medium, large, and very large hotels/mega hotels. The study target population for qualitative data were 13 key stakeholders.

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The researcher determined the sample size using the Krejcie and Morgan table (Krejcie & Morgan, 1970). According to Nakuru County Tourism Department, there are 259 registered hotels in Nakuru County that have been classified officially as medium, large, and very large hotels. The following formula was used:

$$S = \frac{x^2 NP(1-P)}{d^2(n-1)+x^2 p(1-p)} \quad (1)$$

N = the target population (259)

S = sample size

P = the population proportion

$\chi 2$ = the table value of chi-square for 1 degree of freedom at the desired confidence level.

Thus 1.96 x 1.96 = 3.8416 (3.841)

d = the degree of accuracy expressed as a proportion (0.05).

Using the Krejcie and Morgan table, the sample size for the study was 204 hotels as shown in the table below (Krejcie& Morgan, 1970). For quantitative sampling, a stratified random sampling technique was used. This sampling technique was used to divide the entire population into different groups known as strata. The strata comprised of three non- overlapping categories (medium, large, and very large) of hotels that have similar characteristics on basis of the goods and services that they offer. Stratification also ensured that the study population is properly represented. In order to reduce the bias of choice, random selection of respondents from each stratum was selected. Thereafter, random number tables were used to randomly select participants of the study from the County list of hotels to give each participant an equal chance of participating in the study (Chakrabarty, 2017).

Purposive sampling was used to identify key informants to suggest their opinions, views, and ideas on association of green practices, efficiency in solid waste management practices and hotels sustainability that was complimented and triangulate information collected using questionnaires from hotels employee managers in Nakuru County. Purposive sampling was used to generate the list of key informants. The list comprised of government and private officials who are associated with the hotel industry and are conversant with hotel green practices (waste management practices). A total of 13 key informant interviews were conducted with representatives from the following sectors.

Survey questionnaires were used for quantitative data collection. The study used semi structured

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interview guide to collect stories and opinions from key informants that work closely with hotels in selected towns within Nakuru County. The interviews were semi- structured in nature and included a set of consistent questions for all respondents, and more questions were asked based on the initial questions answered by people interviewed. The interview's semi-structured approach allowed for open discussion while ensuring that the interview does not deviate from the subject matter of the study.

The dependent variable for this study was sustainability of hotels' solid waste disposal. This was operationalized from data on the number of times solid waste collected from the hotels for disposal into the municipal dumpsite during high season months. During the questionnaire surveys, hotel managers were asked the number of times solid waste was collected for disposal during high seasons months. Hotels in which the manager reported that solid waste was collected either once a month, twice a month, thrice a month, or four times a month, were categorized as "**LIKELY** to be sustainable solid waste disposal"; while hotels in which the managers reported solid waste collection and disposal times of more than four in a month times – during high peak season, were categorized as "**LESS LIKELY** to be sustainable solid waste disposal" (that is, Unsustainable solid waste disposal). The recomputed outcome variable, binary dependent variable was used for all the inferential statistical analyses (Omune et al., 2021).

Green managemet practices was measured using indicators like hotel budget on green solid waste management practices, policy on green solid waste management practices, staff capacity building on green solid waste management practices, and market for sorted solid waste for recycling and market for sorted solid waste for reuse. Hotel star-rating was assessed on whether the hotel was star- rated or non-rated. Descriptive, bivariate and multivariate level statistical methods were used to summarize the results of this study.

4. RESULTS AND DISCUSSION

The results of the study revealed that 5 stars were the maximum number of star rating of hotels with a minimum of 0-star rating of hotels. These findings are consistent with the findings of Langgat et al., (2023) which revealed that the maximum number of hotel star rating were 5-star hotels. Results of the study revealed that a majority of hotels 192 (94.1%) were non-star rated compared to star rated hotels 12 (5.9%). The possible explanation to this finding is that for a hotel to be rated into different rankings/stars, there are set standards that requires commitment by hotels and also finances to meet the required standards. This might imply that a number of hotels may opt not to incur the extra expenses for star rating since at the moment star rating is not a legal requirement. These findings are consistent with the findings of Waita et al., (2020) which revealed that there were only 12 hotels that were star rated by the Tourism Regulatory Authority in Nakuru in 2014. Indicating that majority of the hotels in Nakuru were non-star-rated.

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In addition, survey findings showed that the proportion of star rating tended to decrease with increase in the number of stars from 2.0% for those that are 2 and 3 star-rated, dropped further to 1.5% for those that are 4 stars rated and further dropped to 0.5% to those that are 5star. In addition, majority of hotels (94.1%) are not star rated. The possible explanation to this finding is that demands by the hotels in terms of financial budgets and standards increases with increase in the number of stars. This might imply that a number of hotels might choose to be non-star rated to avoid the extra costs and commitments that are linked to star rating of hotels so that they can maximize their profits. These findings are consistent with the findings of Langgat et al., (2023) which revealed that majority (50%) of the hotels were 3 star-rated but only (18%) of the hotels were 5 star rated. Indicating decline in rated hotels with increase in the number of star rating. Table 1 presents across tabulation with sustainability status of hotel's waste disposal practices.

Table 1: Cross tabulation of factors associated with hotel's sustainability of solid waste disposal

Variable/response	Likely to be Sustainable solid waste disposal	Less likely sustainable solid waste disposal	Chi-square	p-value
Hotel Size			**17.04**	**0.001**
Small	33 (28.4%)	15 (17.0%)		
Medium	47 (40.5%)	61 (69.3%)		
Large	36 (31.0%)	12 (13.6%)		
Hotel has Budget			**16.12**	**0.001**
Yes	7 (6.0%)	23 (26.1%)		
No	109 (94.0%)	65 (73.9%)		
Hotel has Solid Waste Management Policy			**29.89**	**0.001**
Yes	24 (20.7%)	51 (58.0%)		
No	92 (79.3%)	37 (42.0%)		
Staff Capacity in Solid Waste Management			**19.63**	**0.001**
High	102 (87.9%)	54 (61.4%)		
Low	14 (12.1%)	34 (38.6%)		
Access to market of solid waste recycling (Plastic bottles company)			**19.79**	**0.001**
Yes	88 (75.9%)	40 (45.5%)		
No	28 (24.1%)	48 (54.5%)		

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Access to market of solid waste recycling			**57.53**	**0.001**
Yes	92 (79.3%)	23 (26.1%)		
No	24 (20.7%)	65 (73.9%)		
Access to market of solid waste Sorted for Reuse Hotel			**21.14**	**0.001**
Yes	54 (46.6%)	14 (15.9%)		
No	62 (53.4%)	74 (84.1%)		

Results of binary regression showed that accounting all previously discussed independent variables in addition to hotel's star rating status, hotel's star-rating did not significantly influence the overall performance of the model, hence the model performance remained at 80.9%. Keeping all other factors constant, results show that for star rated hotels, the negative coefficient was -0.273, indicating a tendency towards a lower likelihood of adopting sustainable waste disposal practices compared to hotels that are not star rated. The odds ratio of 0.761 suggested that star-rated hotels were approximately 0.761 times as likely to adopt sustainable waste disposal practices compared to their counterparts, but this difference did not reach statistical significance. However, this relationship was not statistically significant at the conventional level, as revealed by a p-value of 0.732. Therefore, the study did not find evidence to support a significant association between star rating and the adoption of sustainable solid waste disposal practices among hotels. It is worth noting that these results may be biased against non- star rated hotels because they constitute over 94% of the surveyed hotels. To further explore this, the researcher conducted a marginal effect. Table 2 presents the Marginal Effects Analysis results of star-rating in moderating the association between hotel green solid waste management practices and Sustainability of Hotels' Solid Waste Disposal.

Table 2: Marginal effects model summary

Variable/response	dy/dx	SE	P-value
Hotel size (Small)			
Medium	-0.214	0.070	0.002
Large	0.009	0.081	0.90
Hotel has Budget (Yes)			
No	0.073	0.090	0.41
Hotel has Solid Waste Management Policy			

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(No)			
Yes	-0.231	0.063	0.001
Staff Capacity in Solid Waste Management			
(Low)			
High	0.123	0.075	0.09
Access to market of solid waste recycling (Plastic bottles company)			
(Yes)			
No	0.037	0.061	0.54
Access to market of solid waste Sorted for Reuse Hotel			
(Yes)			
No	-0.164	0.063	0.009
Access to market of solid waste for reuse by Community members			
(Yes)			
No	-0.023	0.085	0.78
Access to market of solid waste for reuse by Soap Vendors			
(Yes)			
No	-0.334	0.091	0.001
Self-rated efficiency on sorting solid waste for disposal			
(Low)			
High	0.074	0.060	0.214
Star-rating			
(Not star rated)			
Star rated	-0.038	0.111	0.734

Note: dy/dx for factor levels is the discrete change from the reference category.

Results show that star-rated hotels exhibit a marginal effect of -0.038 (SE = 0.111), indicating a slight decrease in the probability of adopting sustainable waste disposal practices compared to not star rated hotels. However, this difference is not statistically significant at the conventional level, with a p-value of 0.734. Overall, these findings suggest that star-rating may not be a significant determinant in the adoption of sustainable waste disposal practices within the hotel industry. Further investigation may be necessary to explore additional factors influencing sustainability efforts in waste management among hotels. These findings are consistent with the findings of Piya et al. (2022) which revealed that the green score of 14 star-rated hotels in Saudi Arabia varied in the range of 0.44 to 0.74, concluding that the higher ranking of hotel in terms of stars does not necessarily mean that they were the best in implementation of green practices. These suggest that the star ratedness of hotels is not a significant determinant in the adoption of

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sustainable solid waste disposal practices. Table 3 summarizes additional findings from the qualitative analysis.

Table 3: Nakuru County Hotels' Enablers, and Barriers of Hotel Waste Management

Categories	Subcategories	Number of Mentions
Enablers of hotels' solid waste reduction to the dumpsite	Government policy	6
	Hotels' practices to minimize waste	4
	Composting	1
	Research	1
	Sensitization	5
Barriers that hotels face in their attempt to reduce solid waste reduction	Perception towards waste use and disposal	2
	Lack of knowledge on the management of hotels' solid waste	4
	Lack of enabling government policy	2
	High initial costs	2
	Lack of hotel solid waste management infrastructure	6
	Lack of markets for solid waste	2
		36

Excerpts from the qualitative analysis have been integrated in the presentation of findings from the quantitative data. Results summarized in the Table 3 further reveal deeper insights into the sustainability of solid waste management by hotels. The results support those obtained from the quantitative analysis by further clarifying that policies on green solid waste management practices has enabled to reduce solid waste collection for disposal as the policies act as a guide on proper management of solid waste to reduce the volumes collected for disposal. In addition, qualitative results have supported quantitative results by revealing that sensitization of hotel staff

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through capacity building of staff help increase their knowledge and skills in reduction of solid waste and proper management of solid waste through practices such as segregation of solid waste and this had enabled reduction of solid waste volumes collected for disposal. Moreover, the results of the study supported quantitative findings that there are challenges in relation to staff capacity building on green solid waste management practices and hotels management should capitalize on that to improve on staff skills on management of solid waste. More so, qualitative findings supported quantitative results on low budgets for green solid waste management practices and the findings suggest that financial barriers act as obstacles for association of green solid waste management practices by hotels and this can contribute to unsustainable solid waste management practices. Further, qualitative results supported quantitative findings on hotels adoption of green solid waste management practices through sorting solid waste for recycling and reuse as a number of hotels had engaged in activities to minimize their waste. Additionally, the qualitative results supported quantitative results on limited access to markets for solid waste sorted for recycling and reuse.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The study also arrived at the conclusion that majority of the hotels have a policy on sound solid waste management practices but do not have a budget supporting sound solid waste management practices. The existence of a solid waste management policy is significantly related with sustainability of hotel's solid waste disposal. The study further concludes that a majority of the hotels do not build the capacity of employees on hotels green solid waste management practices. Staff capacity building in solid waste management practices showed a significant relationship with sustainability of hotel's solid waste disposal. In addition, access to markets for solid waste sorted for recycling including plastic bottles companies and soap vendors have statistically significant impact on sustainability of hotel's solid waste disposal.

The study concludes that a majority of hotels are non-rated hotels as rating of the hotels was not mandatory. The study also concluded that there is a tendency towards a lower likelihood for star rated hotels adopting sustainable waste disposal practices compared to hotels that are non-star rated. The study also concludes that there is a slight decrease in the probability of adopting sustainable waste disposal practices compared to non-star rated hotels. Moreover, the study concludes that importance of the relationship between green practices and sustainability of hotel's solid waste disposal is crucial for all hotels, regardless of star rating. Implementing these practices: reduces environmental impact: by diverting waste from landfills and promoting resource conservation, hotels contribute to a more sustainable future.

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In addition, it improves operational efficiency: effective waste management can potentially lower wastes hauling fees and contribute to cost savings. Also, it enhances guest experience: eco-conscious travelers appreciate hotels that prioritize sustainability, potentially leading to increased guest satisfaction and loyalty. While star rating can influence a hotel's resources and the pressure to implement green practices, it's not the sole determinant of sustainability of hotel's solid waste disposal. Hotels of all ratings can achieve significant progress by focusing on waste reduction, efficient segregation, and exploring solutions like composting (if feasible). A well-designed waste management plan with a strategic approach is noteworthy to achieving long-term sustainability.

5.2 Recommendations

The study recommends that rating of hotels into different stars should be informed by the association of hotel green solid waste management practices to enhance sustainability of hotel's solid waste disposal. The Kenya Tourism Regulatory Authority should consider assessing association of hotel green solid waste management practices including policies, budget and capacity building while rating hotels into different categories. This criteria for rating hotels on basis of association of green solid waste management practices is enhance sustainability of hotel's solid waste disposal.

Hotels should promote sustainability of their solid waste disposal, considering the influence of star-rating incorporates general strategies, including: prioritize waste reduction: this is the most impactful approach regardless of budget. Implement strategies like: portion control in restaurants, opt-in laundry service, refillable dispensers for toiletries, and offering reusable items to guests (cloth napkins, water bottles).

Recommendations for higher-star hotels include: leverage resources for investment: explore opportunities like: on-site composting facilities (if feasible), partnership with advanced waste management companies for sorting and processing, and investing in technology solutions for waste monitoring and optimization. Also, showcase sustainability efforts: highlight green initiatives on the website and in guest rooms, partner with eco-friendly suppliers for cleaning products and biodegradable packaging, and consider green certifications to showcase commitment.

Recommendations for lower-star hotels include: focus on low-cost practices: implement strategies that require minimal investment: clear signage for waste segregation, partnerships with local organizations for food bank donations, and refill water stations instead of individual bottles. In addition, explore local resources: research grants or programs for waste management improvements, collaborate with other local businesses for better access to recycling or reuse

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markets.

For all hotels, the study recommends: development of a green solid waste management policy: outline goals, procedures, and staff responsibilities for waste reduction, reuse and recycling. In addition, invest in green solid waste management training: empower staff with the knowledge and skills to properly segregate waste, implement reduction techniques, and effectively communicate with guests. Also, promote guest participation: educate guests about the hotel's waste management practices through signage, information materials, and even welcome messages. Encourage their participation in waste reduction, reuse, and recycling efforts. Moreover, continuously monitor and adapt: regularly track waste generation and diversion rates. Adapt and improve practices based on data and local opportunities (e.g., new recycling markets, composing programs). By implementing these recommendations, hotels of all-star ratings can significantly improve the sustainability of their solid waste disposal system. Remember, a strategic and data-driven approach that prioritizes waste reduction, staff training, and guest participation is significant to long-term success.

The current study was limited to hotels in Nakuru County; thus, future studies should consider replicating this study to other counties in order to support the generalization of the findings. Future studies should establish how hotel size affects sustainability of hotel's solid waste disposal. The current study findings revealed that there is no statistically significant effect of hotel size from small to large hotels on sustainability of hotel's solid waste disposal. Further qualitative research is needed to further explore insights into the complexity between hotel size and sustainability of hotel's solid waste disposal.

REFERENCES

Abdou, A. H., Hassan, T. H., & Dief, M. M. (2020). *A Description of Green Hotel Practices and Their Role in Achieving Sustainable Development. Sustainability*, *12*(9624), 1–20.

Abuelhassan, E., & Elsayed, Y. (2020). *The Impact of Employee Green Training on Hotel Environmental Performance in the Egyptian Hotels*. *International Journal on Recent Trends in Business and Tourism*, *4*(1), 24–33.

Agesa, W., Kamau, B., & Kivuva, A. (2022). *Waste Management Practices Influence on Operating Cost among Selected Classified Hotels in Nakuru County, Kenya*. *Journal of Hospitality and Tourism Management*, *5*(1), 93–119.

Agyeiwaah, E. (2020). *The Contribution of Small Accommodation Enterprises to Sustainable Solid Waste Management*. *Journal of Hospitality and Tourism Management*, *44*(2020), 1–9.

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

Akinyi, O. C. (2021). *Human Resource Management Challenges in Star Rated Hotels, Nakuru County Kenya* [Master's Thesis]. University of Nairobi.

Avni, R. D. (2020). *Status and Causes of Deterioration of Wetlands in the Eastern Riftvalley, Case Study of Lake Nakuru—Kenya* [Master's Thesis]. University of Nairobi.

Castiglioni, G., Vieira, L., Corrêa, L. B., & Siqueira, T. (2018). *Solid Waste Generation in a Hotel Event Service*. *Rev. Int. Contam. Ambie.*, *34*(2), 237–247.

Chikezie, J., Adedeji, E. O., Onihunwa, J. O., Meduna, P. N., & Joshua, D. A. (2023). *Waste Management Practices and Operational Performance of Hotels in Lagos State Nigeria*. *Journal of Applied Sciences and Environmental Management*, *27*(4), 781–785.

Chikwendu, M., Uchendu, U., & Kanu, C. (2019). S*olid Wastes Composition and Generation in Selected Hotels at Aba and Umuahia, Abia State, Nigeria*. *Journal of Applied Sciences and Environmental Management*, *23*(9), 1665–1669.

Filimonau, V., Rosa, M. S., Franca, L. S., Creus, A. C., Ribeiro, G. M., Molnarova, J., Piumatti, R. G., Valsasina, L., & Safaei, A. (2021). E*nvironmental and Carbon Footprint of Tourist Accommodation: A comparative Study of Popular Hotel Categories in Brazil and Peru*. *Journal of Cleaner Production*, *328*(2021), 129561.

Giri, S. (2021). *Integrated Solid Waste Management: A Case Study of a Hotel in Kathmandu, Nepal. International Journal of Multidisciplinary Research*, *7*(5), 264–268.

Juvan, E., Grün, B., & Dolnicar, S. (2023). *Waste production patterns in hotels and restaurants: An intra-sectoral segmentation approach*. *Annals of Tourism Research Empirical Insights*, *4*(1), 1–9.

Kariuki, J. M., Magana, A., & Margaret, B. (2020). *Soil Concentration of Selected Heavy Metals in Chuka, Nakuru and Thika Municipal Dumpsites*. *African Journal of Science, Technology and Engineering*, *1*(2020), 1–21.

Kiogora, M. T., Raini, A. J., Kimotho, J. M., & Nyamao, N. W. (2022). *Solid Waste Characterization, Quantification and Management Practices in Nakuru City, Kenya. County Government of Nakuru*.

Mensah, I. (2020). *Waste Management Practices of Small Hotels in Accra: An Application of the Waste Management Hierarchy Model. Journal of Global Business Insights*, *5*(1), 33–46.

Mulati, E. K., & Juma, D. (2019). *Influence of Green Procurement Training on Organization Performance on Star Rated Hotels in Kisumu City*. *The Strategic Journal of Business &*

ISSN: 2455-8834

Volume:10, Issue:12 "December 2025"

Change Management, *6*(2), 1763–1775.

Omune, B., Kambona, O., Wadongo, B., & Wekesa, A. (2021). *Environmental Management Practices Implemented by the Hotel Sector in Kenya. World Leisure Journal*, *63*(1), 98–108.

Phu, P. S. T., Hoang, M. G., & Fujiwara, T. (2018). *Analyzing Solid Waste Management Practices for the Hotel Industry. Global Journal of Environmental Science and Management*, *4*(1), 19–30.

Piya, S., Shamsuzzoha, A., Azizuddin, M., Al-Hinai, N., & Erdebilli, B. (2022). *Integrated Fuzzy AHP-TOPSIS Method to Analyze Green Management Practice in Hospitality Industry in the Sultanate of Oman*. *Sustainability*, *14*(3), 1–22.

Salem, R., Bahadori-Jahromi, A., Mylona, A., Godfrey, P., & Cook, D. (2020). E*nergy Performance and Cost Analysis for the nZEB Retrofit of a Typical UK hotel*. *Journal of Building Engineering*, *31*(2020), 101403.

Stackegård, A. S., & Ivarsson, R. (2022). *Sustainability and waste sorting management in small scale hotels in Sri Lanka* [Bachelor's Thesis]. KTH Industrial Engineering and Management.

Viachaslau, F., & Tochukwu, C. O. (2020). *Exploring Managerial Approaches to Mitigating Solid Waste in Hotels of Lagos, Nigeria. Journal of Cleaner Production*, *270*(2), 1–43.

