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The Adoption of Energy Management Practices (A Circular Economy Principle) and Its Influence on Customer Satisfaction Among Star-Rated Hotels in Kenya

O. Alphonce Juma, Anthony W. Pepela
Pwani University, Kilifi, Kenya
Roselyne Okech
Memorial University of Newfoundland, St John's, Canada

The tourism industry is considered a significant contributor to foreign exchange for many economies worldwide. Despite its positive contributions, there are challenges that the tourism sector poses and cannot be disregarded. Tourism and hospitality still contribute 8% of the greenhouse gas (GHG) emissions globally. These challenges have led many destinations to adopt strategic business models in their operations to mitigate the negative impacts of climate change. This research sought to assess the relationship between the level of adoption of energy management and customer satisfaction among star-rated hotels in Kenya. The study's specific objective was to determine if the adoption level of energy management practice among star-rated hotels in Kenya influences customer satisfaction. The study population consisted of 48-star-rated hotels and 8,731 hotel customers in the Coast Region, Kenya. The study used a mixed-method research design. Stratified sampling was used to select the 2-to-5-star-rated hotels. Disproportionate sampling was used to apportion questionnaires to hotels, while simple random sampling was employed to pick customers. Required data was gathered from customers through structured questionnaires, interviews, and personal observation. The data collected from questionnaires was coded and transcribed into Statistical Package for Social Sciences (SPSS v.29). A multiple regression analysis established statistically predictive estimates of energy management on customer satisfaction ($B = 0.752$, $t = 6.649$, $p = 0.000 < 0.05$). The study recommends that energy management practices be integrated into hotel processes for better customer satisfaction. Star-rated hotels need to communicate hotel policies and structure customer sensitisation on sustainable energy management to attract environmentally conscious customers—the fastest-growing segment of the hotel market.

Keywords: circular economy, customer satisfaction, energy management, star rated hotels

Introduction

Tourism contributes immensely to Kenya's foreign exchange. In 2023, it raised Ksh 1 trillion (WTTC, 2024).

O. Alphonce Juma, PhD candidate, Department of Hospitality and Tourism Management, School of Business and Economics, Pwani University, Mtwapa, Kenya.
Anthony W. Pepela, PhD, Dr., Department of Hospitality and Tourism Management, School of Business and Economics, Pwani University, Mtwapa, Kenya.
Roselyne Okech, PhD, professor, School of Arts and Social Sciences, Grenfell Campus, Memorial University of Newfoundland, St John's, Canada.

In fact, the industry contributes 9% of the total employment opportunities in Kenya, which translates to 1.6 million jobs (Economic Survey, 2020). Globally, the hotel industry generated USD 1.5 trillion in 2023, showing a 5% increase over the previous year (Statista, 2024). Despite the substantial global economic contributions from tourism and hospitality, the sector faces increasing scrutiny due to its environmental footprint emanating from consumerism (Mbokazi, 2024). In Kenya, the impact of climate change has resulted in a socio-economic loss estimated to be in the range of 3% to 5% of Gross Domestic Product (GDP) in the last 10 years (AfDB, 2018). The transportation sector contributes 75%, lodging 21%, and activities 4% to the greenhouse gas (GHG) emissions associated with tourism (United Nations World Tourism Organisation [UNWTO], 2022).

Due to this eminent global crisis, nations pledged to enhance their decarbonisation strategies and offer a revamped framework for the international carbon market at the Conference of Parties (COP26) summit (Brahic, Dobbs, & Vaitheeswaran, 2021). In addition to this commitment, the Green Economy Strategy and Implementation Plan (GESIP) of 2017 by the Kenyan government intends to promote resource efficiency, low carbon uptake, fair and all-encompassing socio-economic transformation through the incorporation of a circular economy (CE) to alleviate the effects of climate change.

Circular economy (CE) is a business model built on industrial and economic principles that promote reuse of products and basic components to maximise the utility value of natural resources (Koech & Munene, 2020). It operates under the principle of sharing, repair, reuse, reform, and recycling aimed at always maintaining the utility value of products and materials (Bartl, 2018; Sehnem, Pandolfi, & Gomes, 2019). The traditional 3Rs (reuse, reduce, and recycle) principles of CE practices have been mooted as sustainable strategies that can mitigate the impacts of climate change by hotels (Tri & Panji, 2020). CE works on the "make-use-recycle" philosophy. CE creates environmental, customer, and resource values for businesses revolving around waste, water, and energy management (Netherlands Enterprise Agency [NEA], 2021).

Many studies have concentrated on CE models in other industries (Florido, Jacob, & Payeras, 2019; Rajic, Maksimovic, & Milosavljevic, 2022), with few studies in the hospitality industry (Anton & Almeida, 2019; Mugure, 2021). These studies present scanty empirical evidence that links CE and customer satisfaction from the Kenyan context, exhibiting contextual and conceptual gaps. Guyader, Ponsignon, Salignac, and Bojovic (2022) recommended studies that are customer-focused to complement provider-orientated manufacturing research linking CE and customer satisfaction. This is the gap the current study aimed to address. Energy management was employed as an indicator for assessing CE adoption by star-rated hotels in Kenya. The study was guided by the following objective: to determine if the adoption level of energy management practices among star-rated hotels in Kenya influences customer satisfaction.

Additionally, the study was guided by the following hypothesis:

$H_0$1: The adoption level of energy management practice among star-rated hotels in Kenya has no significant influence on customer satisfaction.

H_a1: The adoption level energy management practice has a significant positive influence on customer satisfaction.

Literature Review

Global Energy Use in Hotels

Coal and natural gas account for almost three-quarters of all energy consumed in the 28 countries within the European Union (European Commission, 2017). Globally, agriculture and food production generate 12% of

global GHG emissions and consume 21.3 billion tonnes of resources annually (De Wit et al., 2020). Hotels in particular account for approximately 1% of global CO_2 emissions (Llanso, 2024). Hotel buildings are classified as one of the highest energy consumption building categories (Van Dat & Quang, 2018). This is due to their unique operational features, such as 24-hour daily use of energy-intensive technology to provide modern conveniences and recreational activities. According to Sheng et al. (2018), the energy used by hotels for air conditioning, hot water, and laundry is more often generated from the burning of fossil fuels, such as oil and liquefied petroleum gas (LPG).

Adebitan (2019) averred that hotel size, gross floor area, construction year, type of energy, occupancy rate, and hotel star rating are the significant factors affecting energy consumption. Previous studies indicate that the hotel industry in the past has adopted different energy conservation measures (Kim, Palakurthi, & Hancer, 2016; Wuleka, Isaac, & Conrad, 2017; Bohdanowicz, 2019), majorly driven by profit motives (Osiako & Reddy, 2020).

Guest Preferences for Sustainability

Several studies have delved into the increasing guest preferences for sustainably behaving hotels (Balaji, Jiang, Jha, 2019; Murimi, 2020; Svec et al., 2021). As market competition intensifies, it is crucial to understand the critical factors that contribute to guest satisfaction in order to maintain a solid market position (Nazarian et al., 2024). Hoteliers may need to diversify their products and implement environmental initiatives and green practices since customers are more sophisticated and concerned about environmental matters (Graci & Dodds, 2018).

A study by Pujar and Deshpande (2017) to understand customer awareness of sustainability initiatives taken at star category hotels in the Hinjewadi area of Pune found that out of 250 customers sampled, 81.2% were found to be interested in sustainable practices, and 90% were ready to support the hotel in its sustainable practices. The adoption of energy conservation has faced numerous challenges, including a lack of effective ways of review, monitoring, and evaluation, to the extent that the cardinal principles of reduce, reuse, and recycle have not been fully accepted by hotels in Kenya (Osiako & Reddy, 2020).

On whether hotels adopt renewable energy management, Vourdoubas (2016) carried out a study on the measurement of energy usage and the utilisation of renewable energy in hotels in Greece. The study established that hotels in Greece utilised renewable energy from geothermal, thermal, and biomass sources. Furthermore, Girard and Nocca (2017) noted that most Italian hotels use natural gas and electric buses. In addition, Manniche, Topsø, Brandt, and Holland (2017) asserted that hotels should adopt sound environmental management systems and provide renewable energy sources within reach to attain circularity in energy management.

Adoption of Energy Practices in Kenya

Adoption of green practices by hotels in Kenya is on the rise, as reported in emerging studies, such as green energy like solar energy (Murimi, 2020). Chomba, Bichage, and Kariuki (2022) carried out research on the influence of energy conservation practices on customer satisfaction in 24 star-rated hotels in the Mt. Kenya Region, Kenya. The study found out that energy conservation practices had a positive correlation with customer satisfaction in star-rated hotels.

In order to establish the implementation level of energy management practices by star rating, Gaturu, Mutinda, and Miricho (2022), in a study on cost reduction strategies and guest satisfaction among 44 hotels in the Coast Region of Kenya, established that energy strategies were greatly implemented by the 5-star-rated hotels and 4-star-rated hotels because of their financial strength to purchase the most efficient energy appliances as

compared to the 2- and 3-star-rated hotels. Furthermore, the study revealed that implementation of water and energy conservation strategies by hotels positively affects guest satisfaction in Kenya's Coast Region. Travellers are now more informed and selective, often seeking out accommodations that align with their values of preserving the planet (Llanso, 2024). However, uptake of these practices depends on how tourism establishments communicate their actions to different stakeholders (Antonova, Ruiz-Rosa, & Mendoza-Jimenez, 2022).

Methodology

Kenya's Coastal Region is home to 4,329,674 people covering an area of 79,686.1 km^2 (KNBS, 2020). Its coastline spans over 600 km, bordering Tanzania to the south and Somalia to the north. The major economic activities in the region include tourism at 45%, maritime at 15%, agricultural industry at 8%, fisheries at 6%, agriculture at 5%, forestry at 4%, and mining at 2% (UNEP-Nairobi Convention, 2019). The Coast Region's environment is characterised by various marine and coastal ecosystems that make the coastline's sandy beaches very attractive for beach tourism, thus attracting approximately 60% of the total tourists visiting Kenya (Maarifa Centre, 2021). This research targeted all 48 2- to 5-star-rated hotels found within the coastal region of Kenya.

The study employed a mixed-method research design, particularly with the embedded approach. Data was collected at two levels. The first level, quantitative data, was collected from customers using questionnaires, while the second level, qualitative data, was collected from hotel staff using interviews.

The study sampling frame consisted of the four strata ranging from 2- to 5-star hotels, each representing a hotel star rating. One hotel was picked from each of the four strata for pretesting. Therefore, the final sample frame consisted of 44 hotels. Stratified sampling was used to select the hotels. Disproportionate sampling was used to apportion questionnaires to hotels under each stratum. Simple random sampling was used to select customers from each hotel for the questionnaires.

The researcher gathered primary data from firsthand sources through questionnaires, interviews, and personal observation. The three sets of multiple data instruments were used for the purpose of triangulation to improve the certainty of the data collected and validate the information gotten from each category of respondents. The questionnaires had closed-ended questions, which were evaluated on a Likert-type five-point scale. To measure the level of adoption of energy management, the study used a scale of 1 to 5, where scale 1 = Not at all, 2 = Little extent, 3 = Somewhat extent, 4 = To a large extent, and 5 = To a great extent. For customer satisfaction, the study used a scale of 1-5, where 1 = Extremely unlikely (EU); 2 = Unlikely (U); 3 = Neutral (N); 4 = Likely (L); and 5 = Extremely likely (EL).

The reliability of the research instrument was determined through Cronbach's Alpha using SPSS v.29 for energy management constructs and customer satisfaction using the cut-off criterion of 0.700. The reliability test revealed that energy management practice had a reliability score of 0.841, while customer satisfaction had a reliability score of 0.843. The overall Cronbach's Alpha was 0.842. Mandan and Kesinger (2017) suggested a cut-off value of 0.70 to demonstrate that all the study constructs were reliable for data transformations and analysis.

A research authorisation letter was obtained from Pwani University Ethics Review Committee, Graduate School, which is certified by the National Commission for Science, Technology and Innovation (NACOSTI). In addition, a research permit was obtained from NACOSTI. The researcher personally conducted face-to-face oral interviews for the heads of maintenance departments and conducted personal observation in each hotel through booked appointments. Structured questionnaires were administered by the researcher or with the help of research assistants. Data collection of the questionnaires took approximately two months.

Findings

Out of the 367 questionnaires, 355 (96.7%) were collected, while 12 (3.3%) were not returned. Out of the 44 heads of maintenance departments targeted for interviews, only 43 (97.7%) interview schedules were filled. Out of the possible 44 hotels that were targeted for the personal observation survey, only 43 (97.7%) were reached. Table 1 outlines the summary of the respondent's demographics.

Table 1

Respondents Demographics

Demographics	Indicators	Response rate (%)
Gender	Male	165 (46.5%)
	Female	190 (53.5%)
	Prefer not to say	-
Age	18-24	44 (12.4%)
	25-34	106 (29.9%)
	35-44	128 (36.1%)
	45-54	55 (15.5%)
	55-64	22 (6.1%)
	65 or over	-
Level of education	Certificate and below	33 (9.3%)
	Diploma	171 (48.2%)
	Degree and above	151 (42.5%)
Duration of product usage	3 years and below	238 (67%)
	4-8 years	117 (33%)
	9-13 years	-
	Over 14 years	-

Influence of Energy Management Practices on Customer Satisfaction

The respondents were requested to rate the extent to which hotels have incorporated energy management practices in their operations and how it influences customer satisfaction.

Table 2

Descriptive Statistics for Adoption Level of Energy Management Practices in Star-Rated Hotels

Indicators	NA	L	S	TLEI	TGE	Mean (SD)
Use of energy saving bulb and solar panel in reducing energy	2.3	5.1	16.6	37.5	38.6	4.05 (0.979)
Building designs that allow in natural energy like natural lighting from sun	2.8	5.4	17.7	43.4	30.7	3.94 (0.975)
Displaying energy saving notice/signage near main switches	6.2	9.3	16.9	38.3	29.3	3.74 (1.155)
Installation of digital timer/sensor for pathway lights	2.8	7.6	27.6	36.9	25.1	3.74 (1.009)
Sensitising customers on energy management on check in	5.6	8.5	22	39.2	24.8	3.69 (1.105)
Aggregate						3.83 (1.045)

Notes. n = 355, NA = Not at All, L = Little, S- = Somewhat, TLE = To a Large Extent, TGE = To a Great Extent, SD = Standard Deviation.

Study findings in Table 2 indicate the adoption level of various energy management practices by star-rated hotels at varying levels. Energy-saving bulbs and solar panels were adopted to a large extent by 37.5% of star-rated hotels, with 38.6% incorporating them to a great extent. The mean score for this practice was 4.05, with a standard deviation of 0.979 (M = 4.05, SD = 0.979), suggesting strong adoption with minimal variation. Similarly,

building designs that allow natural lighting were incorporated to a large extent by 43.4% of star-rated hotels, and 30.7% adopted this practice to a great extent, resulting in a mean score of 3.94 and a standard deviation of 0.975 (M = 3.94, SD = 0.975), indicating consistent implementation across hotels.

Furthermore, the practice of displaying energy-saving signage near main switches was mainly incorporated by 38.3% of star-rated hotels, with 29.3% adopting it to a great extent. This resulted in a mean score of 3.74 and a standard deviation of 1.155 (M = 3.74, SD = 1.155), showing moderate adoption with some variability among star-rated hotels. Similarly, the installation of digital timers or sensors for pathway lights was adopted to a large extent by 36.9% of hotels, and 25.1% of hotels incorporated it to a great extent, yielding a mean of 3.74 and a standard deviation of 1.009 (M = 3.74, SD = 1.009), indicating a solid adoption level but with some variability in responses.

Finally, the sensitisation of customers on energy management during check-in was implemented to a large extent by 39.2% of hotels, with 24.8% adopting it to a great extent. The mean score for this practice was 3.69, and the standard deviation was 1.105 (M = 3.69, SD = 1.105), indicating moderate implementation with some variability across star-rated hotels. Consequently, the study findings indicate that star-rated hotels in the four coastal counties are actively implementing energy management practices.

The study results were confirmed by the findings from the content analysis of interviews and personal observations, which indicated that 97.7% (43) of star-rated hotels had adopted some energy-saving solutions, with 70.5% (31) having installed solar panels as a source of energy. Additionally, the content analysis indicated that 86.4% (38) of star-rated hotels had architectural designs that allowed natural lighting. From the content analysis of personal observation, adoption of energy-saving bulbs stood at 97.7% (43), use of solar panels at 70.5% (31), and energy-saving notices at 79.5% (35) among the star-rated hotels.

Table 3

Descriptive Statistics on the Influence of CE Practices on Customer Satisfaction

Indicators	EU	U	N	L	EL	Mean (SD)
Recommend the hotel to others.	1.1	2.8	12.1	43.1	40.8	4.20 (0.841)
Purchase the hotel services and products again in future.	0.6	3.9	5.9	46.5	43.1	4.28 (0.790)
Spend more on the services and products available.	1.7	3.1	22.8	41.7	30.7	3.97 (0.901)
Increase the number nights of stay.	1.7	7	20.6	43.9	26.8	3.87 (0.945)
Join the hotel loyalty program as a loyal customer.	1.1	4.2	14.1	48.5	32.1	4.06 (0.855)
Rate the hotel highly on on-line marketing platforms (Airbnb, Trip Advisor etc.).	1.1	2.8	8.7	39.4	47.9	4.30 (0.831)
Aggregate						4.11 (0.861)

Notes. n = 355, EU = Extremely Unlikely, U = Unlikely, N = Neutral, L = Likely, EL = Extremely Likely, SD = Standard Deviation.

Table 3 on customer satisfaction with CE (energy management practices) in hotels indicates high levels of customer approval, showing that 40.8% felt likely they would recommend the hotel to others and 43.1% of respondents felt extremely likely, resulting in a mean score of 4.20 with a standard deviation of 0.841 (M = 4.20, SD = 0.841), suggesting strong satisfaction. For the likelihood of purchasing hotel services and products again in the future, 46.5% were likely, and 43.1% were extremely likely, yielding a mean score of 4.28 and a standard deviation of 0.790 (M = 4.28, SD = 0.790), reflecting strong positive sentiment toward repeat business.

Moreover, when customers were asked if they would spend more on the services and products available, 41.7% of respondents were likely, and 30.7% were extremely likely, resulting in a mean score of 3.97 with a

standard deviation of 0.901 (M = 3.97, SD = 0.901), indicating a moderately positive response with some variation. When considering the likelihood of increasing the number of nights stayed, 43.9% were likely and 26.8% were extremely likely, with a mean score of 3.87 and a standard deviation of 0.945 (M = 3.87, SD = 0.945), reflecting a moderate to strong inclination towards longer stays, though with some variability.

Furthermore, for those asked if they would join the hotel loyalty program, 48.5% were likely, and 32.1% were extremely likely, yielding a mean score of 4.06 and a standard deviation of 0.855 (M = 4.06, SD = 0.855), indicating a strong likelihood of customers becoming loyal members. Lastly, when asked if they would rate the hotel highly on online platforms such as Airbnb or TripAdvisor, 39.4% were likely, and 47.9% were extremely likely, resulting in the highest mean score of 4.30 with a standard deviation of 0.831 (M = 4.30, SD = 0.831), demonstrating the strongest level of satisfaction.

Regression Analysis

Table 4

Regression Model Summary for the Relationship Between Energy Management Practices and Customer Satisfaction

R	R square	Adjusted R square	Std. error of the estimate	Durbin-Watson
0.849a	0.721	0.719	9.29287	0.957

From Table 4, the model fitness statistics indicate that the model performs well in explaining the variance in the dependent variable. The correlation coefficient (R) of 0.849 suggests a strong positive relationship between the independent and dependent variables, indicating that the model captures a significant portion of the data's variability. The R-squared (R^2) value of 0.721 shows that 72.1% of the variance in the dependent variable is explained by the independent variables, which is a strong fit. The adjusted R^2 of 0.719, which accounts for the number of predictors in the model, is very close to the R^2 value, further suggesting that the model is well-fitting and not overfitting.

Analysis of Variance (ANOVA)

Table 5

ANOVA

	Sum of squares	df	Mean square	F	Sig.
Regression	78,319.306	3	26,106.435	302.307	0.000b
Residual	30,311.443	351	86.357		
Total	108,630.749	354			

Findings on the ANOVA results indicate that the regression model explains a significant amount of the variance in the dependent variable in Table 5. The Sum of Squares for Regression is 78,319.306, reflecting the variation explained by the model, while the Sum of Squares for Residuals is 30,311.443, representing the unexplained variation or error in the model. The Total Sum of Squares is 108,630.749, representing the overall variation in the dependent variable. The model has three degrees of freedom for regression and 351 degrees for the residuals, leading to a total of 354 degrees of freedom. The Mean Square for Regression is 26,106.435, which indicates the average variation explained by the model, and the Mean Square for Residual is 86.357, showing the average error in the model. The F-statistic of 302.307 suggests that the model is highly significant, and the p-value (Sig.) of 0.000 further confirms that the model is statistically significant, meaning the independent variables are collectively important in explaining the dependent variable.

Table 6

Regression Coefficients

	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	β		
(Constant)	-10.551	1.192		-8.848	0.000
Energy management	0.752	0.113	0.467	6.649	0.000
R squared = 0.849					
Prob > chi2 = 0.0000					

The study sought to test the null hypothesis ($H_0$1) which stated that: The adoption level of energy management practices among star-rated hotels in Kenya has no significant influence on customer satisfaction. This was tested against an alternative hypothesis (H_a1); the adoption level energy has a significant positive influence on customer satisfaction.

The obtained unstandardized coefficient is 0.752, with a standard error of 0.113, resulting in a t-value of 6.649 and a p-value of 0.000, indicating that energy management has a strong and significant positive effect on the dependent variable. The Beta value of 0.467 further confirms a moderate positive relationship (B = 0.752, t = 6.649, p = 0.000 < 0.05). Therefore, the null hypothesis $H_0$1 is rejected, and accept the alternative H_a1 hypothesis is accepted. We come to the conclusion that adoption of energy management has a positive significant influence on customer satisfaction among star-rated hotels in the coast region of Kenya. This implies that a rise in energy management adoption level by a single unit would result in a significant increase in customer satisfaction by 0.752 units with other variables not involved.

The study findings were corroborated by content analysis from interviews and personal observation, which indicated that 97.7% (43) of star-rated hotels had adopted some energy-saving solutions, with 70.5% (31) having installed solar panels as a source of energy, 86.4% (38) having architectural designs that allowed natural lighting, adoption of energy-saving bulbs at 97.7% (43), use of solar panels at 70.5% (31), and energy-saving notices at 79.5% (35) among the star-rated hotels.

Discussions

Influence of Energy Management Practices on Customer Satisfaction

The respondents affirmed that energy-saving bulbs and solar panels were adopted to a large extent by star-rated hotels (M = 4.05, SD = 0.979), suggesting strong adoption with minimal variation. Building designs that allow natural lighting were being incorporated to a large extent (M = 3.94, SD = 0.975), indicating consistent implementation across hotels. Display of energy-saving signage near main switches was being incorporated to a large extent (M = 3.74, SD = 1.155), showing moderate adoption with some variability. Installation of digital timers or sensors for pathway lights was being adopted to a large extent (M = 3.74, SD = 1.009), but with some variability in responses. Furthermore, the respondents attested that sensitisation of customers on energy management during check-in was being implemented to a large extent (M = 3.69, SD = 1.105), indicating moderate implementation with some variability. From the findings, the respondents concurred that some of the indicators of energy management practices had a more significant influence on customer satisfaction than others, as represented by the variance in means and standard deviations across hotels. The outcome of the study corroborates past studies, which deduced that adoption of energy management influences guest experience with hotel products, which in turn affects customer satisfaction (Buunk & van der Werf, 2019; Balaji et al., 2019;

Bohdanowicz, 2019; Svec et al., 2021; Chomba et al., 2022; Gaturu et al., 2022). However, there is limited data on how each indicator of energy management practices influenced customer satisfaction in past studies. Therefore, study results can be considered as new knowledge and a contribution to the existing. The Ministry of Tourism and Wildlife, through the Tourism Regulatory Authority, can use the findings to guide policy formulation on sustainable energy management practices for the hotel establishments.

Satisfaction

From the study results, it can be concluded that customers believed that implementing CE practices (energy management) generally influenced their level of satisfaction with the hotel products or services. For instance, the respondents indicated the adoption of energy management practices by hotels influenced their likelihood to recommend the hotel to others (M = 4.20, SD = 0.841), suggesting strong satisfaction in addition to the likelihood of purchasing hotel services and products again in the future (M = 4.28, SD = 0.790), reflecting strong positive sentiment toward repeat business. The likelihood of spending more on the services and products available stood at (M = 3.97, SD = 0.901); the likelihood of increasing the number of nights stayed at (M = 3.87, SD = 0.945); the likelihood of joining the hotel loyalty program at (M = 4.06, SD = 0.855), indicating a strong likelihood of customers becoming loyal members; and the likelihood of rating the hotel highly on online platforms such as Airbnb or TripAdvisor at (M = 4.30, SD = 0.831), demonstrating the strongest level of satisfaction.

These findings concur with conclusions drawn by other researchers, such as Graci and Dodds (2018), that hoteliers may need to diversify their products and implement environmental initiatives and green practices since customers are more sophisticated and concerned about environmental matters. The findings by Eaton (2017), revealed that the introduction of energy-efficient practices enriches guests comfort, increases hotel aesthetic value, and reduces maintenance system failures. The pursuit for environmentally conscious hotels is on the rise among consumers, and hotels must follow suit (Balaji et al., 2019; Murimi, 2020; Svec et al., 2021). Additionally, the study results concurred with the findings of Chomba et al. (2022), who found out that energy conservation practices have a positive correlation with customer satisfaction in star-rated hotels in Mt. Kenya. Moreover, other researchers have made similar assertions that customer satisfaction is determined by many factors, including environmental and resource usage matters that hotels must take keen interest in to remain competitive in the 21st century (Blad & Ibrahim, 2020; Zibell et al., 2021; Gaturu et al., 2022; Sun et al., 2022; Falatouri et al., 2024; Naazarian et al., 2024).

The implication of the findings for hotels is that they need to train staff and communicate the energy management initiatives to customers to create awareness. Clear communication to customers is an enabler towards customer green behaviour (Dissanayake & Weerasinghe, 2021). There is a need for policy guidelines or standards that compel hotels to report on their energy consumption based on bed capacity from Tourism Regulatory Authority (TRA). Customers and the general public should be sensitised to the importance of patronising environmentally conscious hotel establishments by TRA.

The study concluded that the adoption of energy management influences customer satisfaction among star-rated hotels and should be a priority for hotels that aim to remain competitive. This is supported by arguments by most researchers from the reviewed literature, who asserted that implementation of energy management alleviates environmental degradation problems, promotes guest satisfaction, and contributes to hotel overall performance (Murimi, 2020; Tri & Panji, 2020; Mazur-Wierzbicka, 2021; Chomba et al., 2022). Therefore, guest and staff sensitisation on existing energy management practices by hotels is a priority in the 21st century.

Conclusion and Recommendations

First, since energy has been discovered to be a positive predictor of customer satisfaction among star-rated hotels in the Coast Region in Kenya, the study recommends that the TRA, in collaboration with NEMA, county governments, the Kenya Association of Hotel Keepers and Caterers (KAHC), and the Kenya Climate Investment Centre (KCIC), organise periodic capacity-building sessions for hotel operators to reinforce the need for sustainable energy management and the critical role such practices play in enhancing hotel overall performance and fighting against climate change.

Second, the study recommends that the operators of star-rated hotels in the coast region of Kenya should enhance adoption of low-wattage LED bulbs, energy-saver refrigerators, installation of solar panels, proper building design for natural light, and integration of digital energy management solutions such as light sensors in hallways and washrooms and the use of smart cards for energy management in guest rooms. Furthermore, star-rated hotels must sensitise customers and staff to energy management by providing energy-saving notices at strategic areas within the facility.

Third, the study was conducted among star-rated hotels found in the coast region of Kenya. A similar study can be conducted targeting star-rated hotels in other parts of Kenya far from the coast region or in other countries. This will aid generalisability and curb the limiting situations of the study model.

Lastly, a similar study could be carried out targeting non-rated hotels; other accommodation facilities, including serviced apartments, villas, cottages, and homestays; restaurants; and tour operators in Kenya and across borders.

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