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Original Article

The Role of Social Sustainability Initiatives in Driving GHG-Free Operations: Empirical Evidence from Game Lodges and Tented Camps Within Kenya's Southern Tourism Circuit

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Keywords:

*Social Sustainability,
Zero GHG Emissions,
Renewable Energy,
NGO Collaboration and
Guest Participation,
Local Sourcing and
Economic Support,
Local Hiring and
Workplace Safety.*

This study examined the influence of social sustainability practices and the adoption of zero greenhouse gas (GHG) emission practices among lodges and tented camps in Kenya's Southern Tourism Circuit. A quantitative explanatory research design and multiple linear regression were employed to assess the impact of seven social sustainability initiatives: Community Collaboration and Guest Awareness, NGO Collaboration and Guest Participation, Local Sourcing and Economic Support, Local Hiring and Workplace Safety, Staff Development and Training, Community Contributions, and Employee Welfare. Findings revealed that the regression model was statistically significant ($R^2 = 0.682$, $F(7,65) = 19.957$, $p < 0.001$), indicating that social sustainability practices collectively explain 68.2% of the variance in the adoption of zero GHG emission practices. Three components were found to significantly influence adoption: NGO Collaboration and Guest Participation ($\beta = 0.406$), Local Sourcing and Economic Support ($\beta = 0.642$), and Local Hiring and Workplace Safety ($\beta = 0.247$). However, Community Collaboration and Guest Awareness ($\beta = 0.081$, $p = 0.400$), Staff Development and Training ($\beta = 0.107$, $p = 0.191$), Community Contributions ($\beta = 0.031$, $p = 0.728$), and Employee Welfare ($\beta = 0.146$, $p = 0.083$) were not significant predictors in the regression model. These results suggest that three important factors comprising NGO collaboration and guest participation, local sourcing and economic support, and local hiring and work safety significantly and positively influence the adoption of zero GHG emission practices. Other social factors, such as staff training and employee welfare, though present, may not directly influence the adoption of zero GHG emission practices among lodges and tented camps. For eco-lodge operators in this study, the study recommends that they should deepen collaborations with NGOs and local communities to co-create sustainability programs involving guests. They also need to formalise local sourcing policies and maintain transparent tracking of purchases to encourage local economies and reduce emissions.

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INTRODUCTION

The travel and tourism industry, particularly the hospitality sector, is crucial in supporting long-term economic growth and development internationally, contributing to job creation (Pereira *et al.*, 2021). Despite these contributions, the hospitality sector has been identified as a major source of greenhouse gas (GHG) emissions, contributing considerably to global warming and climate change (Mota *et al.*, 2024). This problem is mostly caused by the sector's excessive consumption of resources such as water, electricity, non-durable goods, and fossil fuels, which leads to the release of toxic emissions into the air, water, and soil (Shereni *et al.*, 2022). Tourism operations often rely heavily on natural landscapes and biodiversity, both of which are increasingly threatened by climate change-induced phenomena such as rising temperatures, unpredictable rainfall, droughts, and habitat degradation (He *et al.*, 2021). Furthermore, lodges and camps frequently build their infrastructure in areas that disrupt carbon sink ecosystems like forests and mangroves, exacerbating the environmental impact (Khatib, 2023). As a result, the hospitality industry now recognises the critical need for immediate climate change mitigation initiatives, including a reduction in GHG emissions.

The Southern Tourism Circuit in Kenya includes some of the country's most prominent tourist

locations, such as Amboseli and Tsavo National Parks. However, climate change poses serious dangers to these places, as indicated by noticeable declines in wildlife populations and modifications in local ecosystems (Borona, 2020). Over time, shifting weather patterns, irregular rainfall, and rising temperatures have had a significant impact on the flora and fauna in these places (Mugo *et al.*, 2021). Droughts, irregular rainfall, and rising temperatures have resulted in water and vegetation shortages, killing species and reducing the visual appeal of these tourism destinations (Okumu *et al.*, 2023).

In 2023, severe droughts ravaged parts of Kajiado and Taita Taveta counties, depleting water sources critical for both wildlife and communities (ReliefWeb, 2023). Wildlife migration patterns have shifted, leading to declining sightings of flagship species such as elephants and lions, thus reducing the visual and experiential value for tourists. In contrast, early 2024 brought intense flooding across the southern regions, damaging roads, lodges, and park infrastructure, making access to key tourist sites difficult (Daily Nation, 2024). These environmental concerns have a direct impact on the appeal of these sites, which influences demand for services supplied by establishments along the Southern Tourism Circuit. These extreme climate conditions, fueled by global warming, are compromising the sustainability of tourism-related enterprises. The Southern Tourism Circuit's high ecological

sensitivity and economic reliance on natural attractions make it particularly vulnerable. Yet, despite this growing threat, many tourism establishments have not adopted adequate climate action measures, often prioritising financial returns over long-term sustainability (Khattib, 2022; Elena, 2023). Given the growing implications of climate change on the Southern Tourism Circuit, establishments and other tourism-related enterprises must take proactive steps to reduce these negative effects and protect the region's ecosystems. This region of Kenya presents a strategic and contextually relevant focus for this study due to its ecological sensitivity, tourism significance, and potential vulnerability to climate change impacts.

The high initial cost of installing renewable energy systems, lack of technical expertise, and limited access to green financing hinder broader adoption of climate-smart practices. Moreover, there is a lack of standardised climate mitigation benchmarks within the tourism industry, making it difficult to measure or compare progress across facilities (Ratinen, 2021).

While hotel businesses around the world are becoming more conscious of the importance of sustainability as a key driver of climate change (Elena, 2023), there are worries about the underlying reasons for adopting sustainable practices. Many businesses appear to prioritise financial benefit or image enhancement over significant climate action (Khatter, 2020; Herath *et al.*, 2023). Therefore, this study sought to evaluate how social sustainability initiatives influence the adoption of zero GHG emission practices among game lodges/tented camps within Kenya's Southern Tourism Circuit.

LITERATURE REVIEW

Adoption of Zero GHG Emissions Practices Within the Hotel Sector

In recent years, the concept of sustainability has emerged as a supreme concern in global affairs. While a universally agreed-upon definition does not exist, Olya *et al.* (2021) underscore that sustainability is largely viewed by policymakers,

intergovernmental organisations, and scholars as the remedy to a range of challenges confronting societies, economies, and the environment across the world. Spiliotopoulou & Roseland (2020) note that though earlier explanations of sustainability were founded on ecological ideologies, successive interpretations provide a comprehensive outlook by integrating social and economic dimensions with environmental goals in a bid to equitably meet human needs.

Sustainability simply alludes to embedding economic, social, and environmental concerns in all aspects of business strategies, practices, and services on an ongoing basis (Hariram *et al.*, 2023; Holt & Whelan, 2021). It focuses on the management of triple bottom lines, commonly referred to as “people, profit, and planet” (Zaharia & Zaharia, 2021). Sustainability has emerged as a basic component of business models in realising business growth and profitability in the long run while at the same time fulfilling environmental and social responsibilities (Purnama, 2024). Thus, when adopting sustainability practices, a business or organisation should take into account the impacts of its activities on people, profit, and the planet.

Samal & Dash (2024) underscore that any entity pursuing sustainability in its operations must utilise environmental resources optimally, maintain viable operations in the long run, show consideration for the host communities, and also distribute all benefits fairly among all the relevant stakeholders. The growing importance of embracing sustainability practices among hotels emanates from the mix of products and services the various establishments offer and the environmental, economic, and social pressures within the industry due to their impacts (Jones & Comfort, 2019).

In the context of the hotel sector, as alluded to by Abdou *et al.* (2020), environmental sustainability denotes the existence of harmony between hotel activities and the environment in which they are created, such that their interactions are mutually beneficial. The main aim is to protect natural resources and minimise the adverse

environmental impacts arising from hotel consumption or operations (Khatter, 2023). Some of the environmental sustainability practices adopted by hotels include the creation of environmental management systems (EMSs), environmentally responsible sourcing, greening practices, and supporting water and energy efficiency measures (Cozzio, 2019; Calisto *et al.*, 2021).

Social sustainability pertains to being able to recognise the needs of populations and social progress (Barron *et al.*, 2023), and within the hotel industry, it entails boosting the well-being of the employees, other suppliers, the guests, and the local community at large (Wijesundara, 2023). Among the social sustainability practices embraced by hotels are the provision of suitable training and safe working conditions, engaging in fair trade and building relationships with customers, and involvement in community initiatives (Pereira *et al.*, 2021).

The economic dimension of sustainability encompasses generating profits and growing the market share of the company while wreaking minimal social and environmental impacts (Alam & Tariq, 2023). According to Kim *et al.* (2023), among other scholars, economic sustainability usually enables businesses to build a positive corporate image, create sustainable jobs, increase shareholder value, and offer high-quality goods and services, among other benefits. Generally, despite the hotel industry's rather sluggish adoption of the sustainability paradigm, as alluded to by Dhirasana and Sahin (2021) among other scholars, the concept has emerged as "a defining issue" for hotel businesses in recent years.

The hotel industry faces significant challenges in recognising and addressing sustainability concerns when compared to other industries such as the manufacturing, transport, and construction sectors, which are making notable efforts to adopt sustainability practices (Goh *et al.*, 2020). It is argued by Kularatne *et al.* (2019) that whereas some hotel establishments have implemented fragmented practices, others have formulated formal policies. Nevertheless, as underlined by

López-Gamero *et al.* (2024), historically, businesses have prioritised financial gains such as cost-efficiency and enhanced corporate reputation over social and environmental sustainability. Hence, the reasons for hotels' implementation of sustainability practices have come under scrutiny (Olya *et al.*, 2021).

On the contrary, academic research has normally tended to extensively focus on the integration of environmental sustainability in the hotel business (Khatter, 2022). Nonetheless, considering the implications of hotels' operations on local communities, the significance of adopting corporate sustainability with a strategic approach that incorporates economic, social, and environmental considerations has been stressed (Pan *et al.*, 2021). This study will explore the environmental, social, and economic sustainability practices implemented by hotels with the Southern Tourism Circuit in Kenya.

Nexus Between Social Sustainability Initiatives and Adoption of Zero GHG Emission Practices

Several studies examining the relationship between social sustainability strategies and climate change mitigation have been emphasised. Darwesh (2023) evaluated the influence of climate change on the aspects of social responsibility in five-star hotels in Egypt. The research employed a survey design in which questionnaires were distributed to a random sample of hotel patrons. The study emphasised the importance of hotels prioritising social behaviours, providing support, and participating in philanthropic and environmental initiatives as essential strategies for addressing or alleviating climate change. The study indicates that implementing philanthropic and social initiatives, such as education and healthcare, to address the impacts of climate change elevated societal cultural levels, thereby aiding communities in understanding the causes and consequences of climate change, as well as strategies for mitigation and adaptation. Darwesh (2023) observed that when hotels emphasised social sustainability, they cultivated stronger relationships with local communities and effectively implemented

environmental awareness programs for both guests and staff, thereby making climate change mitigation a feasible shared objective. This study exclusively examined 5-star hotels and the perspectives of hotel guests, while also concentrating on a distinct situation. The study employed a singular research approach, which constrained the comprehensive examination of the relationship between social sustainability practices and climate change mitigation in the hotel sector.

Mugure (2021) examined the correlation between sustainability and climate change mitigation activities in the context of improved business practices in 5-star hotels in Kenya. The research employed a phenomenological design, utilising in-depth interviews. The study contended that social sustainability, particularly in community development related to education, health, and awareness initiatives addressing climate change threats, is essential for mitigating climate change. This reasoning was based on the observation that the aforementioned programs enhanced excitement and support, spurred self-mobilisation and action, and mobilised local knowledge and resources essential for the successful implementation of climate change mitigation initiatives. The study emphasised the necessity of educating guests, workers, and local community members on the importance and methods of mitigating climate change through the execution of diverse training programs. The previous study concentrated solely on 5-star hotels, and due to the qualitative research methodology utilised, the influence that social sustainability initiatives have on the adoption of zero GHG emission practices was not assessed with empirical data.

Pereira *et al.* (2021) employed a qualitative research methodology, specifically a case study design, to investigate the social sustainability measures implemented by a luxury hotel in Arrábida Natural Park, Portugal. The study revealed that by adopting social sustainability, the chosen luxury hotel offered superior services, engaged with local communities, and participated in social initiatives. The hotel was significantly engaged in the advancement of local communities

by sourcing supplies predominantly from the region, generating employment for residents, and supporting local charities or initiatives through donations and volunteer programs. Additionally, in conjunction with including staff in decision-making, the hotel implemented realistic team-building and coaching initiatives to enhance their understanding of safety, environmental concerns, and quality, thereby empowering them to perform their duties properly. This study exclusively examined the implementation of social sustainability measures in a single hotel and did not evaluate the impact of these activities on climate change mitigation within this framework.

Pereira-Moliner *et al.* (2021) examined the synergistic link between sustainability, competitive advantages, and performance within the Spanish hotel sector. A study was conducted on hotels rated 3, 4, and 5 stars. The study findings indicated that sustainability policies favourably impacted hotels' competitiveness and performance, as seen by enhanced cost control and increased differentiation through improved reputation and guest experience. The study indicated that, among the surveyed hotels, social sustainability was the paramount feature for hotel management, followed by economic and environmental sustainability. In pursuing social sustainability, the social impacts of the hotels were evaluated, collaboration with charitable initiatives was established, the preservation of local heritage was encouraged, and community development was advanced. Furthermore, gender equality was advanced in human resource practices, work-family balance was supported among employees, suppliers were selected based on demonstrable social responsibility, and consumers or visitors were motivated to engage in charitable projects. Respect for the local culture and language was actively encouraged, the facilities surpassed legal accessibility standards, and a civic-minded attitude among patrons was fostered. The study by Pereira-Moliner *et al.* (2021) indicates that the implementation of social sustainability practices improved hotels' ability to address climate change by promoting community engagement, thereby facilitating awareness

programs centred on environmental and climate change concerns. This study emphasised the significance of social sustainability practices in mitigating climate change issues, yet primarily concentrated on their effects on hotel competitiveness and performance. It also implemented a unified research design. The present study assessed the impact of social sustainability initiatives on the adoption of zero GHG emission practices among lodges/tented camps within the Southern Tourism Circuit of Kenya.

Mota *et al.* (2024) conducted a systematic literature review to investigate the effects of climate change on hospitality businesses. Their systematic review of literature indicated that certain empirical research has demonstrated the importance of social sustainability measures in mitigating climate change. The report emphasised that hotels worldwide partnered with local enterprises and endorsed educational and training initiatives that enhanced community understanding of diverse climate change threats and facilitated contributions to extensive mitigation efforts. The study indicated that hotels' environmental awareness initiatives and campaigns fostered increased pro-environmental behaviours among local communities, leading to a reduction in GHG emissions within the sector. The study emphasised that numerous hotels were becoming transparent in informing customers and promoting eco-friendly choices, in addition to investing in staff training on ecologically sustainable operations, efforts which effectively mitigated the implications of climate change. This study concentrates on the pertinent themes but utilises a systematic literature review methodology, hence not employing empirical data to examine the real relationship between social sustainability initiatives and the adoption of zero GHG emission practices among lodges/tented camps.

Odeku (2018) examined the proactive measures implemented by the hospitality sector in South Africa to mitigate the impacts of climate change. The research utilised a comprehensive literature analysis to obtain insights into the necessity for

hospitality businesses to proactively address the adverse impacts of global warming and climate change on travel, tourism, and destinations. The study contended that sustainability initiatives, such as collaborating with local communities for biodiversity conservation, raising awareness about climate change impacts, and providing education or training for staff and customers on prudent energy consumption and emissions reduction, were essential for climate change mitigation. Similar to the research conducted by Mota *et al.* (2024), Odeku's (2018) study did not examine the correlation between social sustainability practices and the adoption of zero GHG emission practices in hotels due to the absence of empirical data collection. The current study filled this gap by gathering quantitative data to facilitate analyses that helped in examining the link between these variables. Furthermore, the previous study examined the South African hotel business, which presents a distinct background compared to the current study, which focused on lodges/tented camps within the Southern Tourism Circuit of Kenya.

METHODOLOGY

Research Design and Target Population

This study adopted a quantitative approach with an explanatory research design. Utilising this design helps in determining the relationships between the constructs under investigation (Saunders *et al.*, 2012). This design was well-suited for this study because it allowed for the exploration of how environmental sustainability initiatives impact the adoption of zero greenhouse gas emission practices. The target population for this study comprised 110 managers drawn from 22 lodges and tented camps within the Southern Tourism Circuit of Kenya. Specifically, this region comprises three branded national parks: Amboseli, Tsavo East, and Tsavo West. The three parks are pivotal to ecotourism efforts in Kenya and are crucial areas for the adoption of sustainability initiatives. Participants were drawn from five departments: front office, housekeeping, kitchen, food and beverage service, and maintenance. These are units that play a vital

role in the daily operationalisation of sustainability practices. Their daily roles and responsibilities, including waste management, energy efficiency, procurement and staff training, make them suitable as key informants on both policy implementation and operational challenges.

Data Collection

Quantitative data were collected using questionnaires. The questionnaires were distributed through a dual-mode approach comprising online and paper formats. The mode of data collection was based on the accessibility and preferences of the participants. The online data collection was accomplished through emails and Google Forms®. This strategy ensured wider participation and inclusivity across the diverse operational contexts of the lodges and camps. Where paper-based questionnaires were required, three trained research assistants familiar with the study region assisted in data collection. Data was collected from mid-February to mid-March 2025.

Data Analysis

The quantitative data analysis in this study utilised the Statistical Package for Social Sciences, SPSS® version 30.0. The analysis incorporated both descriptive and inferential statistical techniques to address the research objective and test the proposed hypothesis. Initially, the data obtained from survey questionnaires underwent a thorough cleaning and preparation process to eliminate errors, handle missing values, and ensure consistency. Descriptive statistics were employed to summarise key attributes of the sample population, using measures such as frequencies, percentages, means, and standard deviations. These statistics provided insights into the demographic characteristics of the respondents. They also offered a general overview of the respondents' perceptions and practices related to environmental sustainability initiatives. These results also revealed the extent to which lodges and tented camps within the Southern Tourism Circuit of Kenya have adopted zero GHG emission practices.

The constructs in this study were measured using items drawn from various sources. Thus, an exploratory factor analysis (EFA) with Varimax Rotation was conducted to establish the underlying factors. EFA merges various measurement items into interpretable components based on shared variance. This facilitates a clearer understanding of the latent constructs underpinning participants' responses. Factors were grouped based on their loadings, which were typically above 0.5. Each established component was named according to the thematic alignment of its items. To assess the suitability of data for factor analysis, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity were used. These findings are elaborated upon in the results section of this manuscript. A multiple linear regression analysis was conducted to test the hypothesis to assess the influence of social sustainability initiatives on the adoption of zero GHG emission practices. This analysis allowed the researcher to establish the relative contribution of each established factor in predicting the adoption of zero GHG emission practices. Results are considered significant when their associated p-values are equal to or less than the 5% level of significance.

RESULTS AND DISCUSSION

Response Rate and Reliability Statistics

This study invited 110 managers drawn from the 22 lodges and tented camps to participate in the online survey. Of these participants, 73 completed the questionnaire, for a response rate of approximately 66.4%. With respect to the reliability analysis, social sustainability initiatives revealed a Cronbach's alpha of 0.856, showing a high internal consistency of measurement items. Likewise, adoption of zero GHG emission practices construct recorded a Cronbach's alpha of 0.927, demonstrating acceptable reliability. Both constructs showed strong reliability with values well above the threshold of 0.70 (Hair *et al.*, 2010).

Respondents' Demographic Profile

A total of 73 participants responded to the survey. Of these, 46 (63.01%) identified as male and 27 (36.99%) as female. The majority of participants ($n = 52$, 71.23%) were aged 30 years and below, followed by 20.55% ($n = 15$) aged 31 to 40 years, and 8.22% ($n = 6$) aged 41 to 50 years. The majority of participants (68.49%) were holders of undergraduate degrees, followed by 15.07% with a master's degree. A relatively smaller proportion of participants either possessed diplomas (13.07%) or PhD qualifications (2.74%). The majority of participants (69.86%) had 5 years or less of experience in their current roles. This was followed by 21.92% with 5 to 10 years of tenure. However, only 8.22% had worked in their roles

for over 10 years. The results show that front office staff made up the largest cohort at 32.88%. This cohort was followed closely by food and beverage service at 30.14%. Housekeeping managers accounted for 17.81% of participants. Food and beverage production was represented by 15.07% of participants, while maintenance and stores were underrepresented, at 2.74% and 1.37%, respectively.

Perceptions of Adoption of Zero GHG Emission Practices

Table 1 presents the descriptive statistics on the extent to which lodges and camps in the Southern Tourism Circuit have adopted zero GHG emission practices.

Table 1: Descriptive Results of Adoption of Zero GHG Emission Practices

Statement	Mean	Std. Dev
My organisation has implemented GHG reduction measures.	3.93	0.991
We monitor and track GHG emissions regularly.	3.52	1.082
The organisation uses energy-efficient technologies to reduce GHG emissions.	3.92	.812
The organisation has adopted renewable energy sources.	4.00	1.054
We have water conservation initiatives that reduce GHG emissions.	4.11	0.951
Waste management at the organisation contributes to reducing GHG emissions.	4.16	0.746
The organisation has set clear GHG emissions reduction targets.	3.71	1.172
Management actively supports GHG emissions reduction initiatives.	3.93	0.948
Staff are trained in GHG emissions reduction practices.	3.97	0.942
The organisation collaborates with suppliers focused on reducing GHG emissions.	3.93	0.839

Notes: $N = 73$. Scale (*Range of Means Interpretation*): 1 = *Strongly Disagree* (SD) (1.00 – 1.79) – 5 = *Strongly Agree* (4.20 – 5.00)

All mean responses fell within the “Agree” range (3.40–4.19), indicating a generally positive adoption across practices. The highest-rated practices included waste management ($M = 4.16$, $SD = 0.746$), water conservation initiatives ($M = 4.11$, $SD = 0.951$), and adoption of renewable energy sources ($M = 4.00$, $SD = 1.054$). Other practices, such as staff training ($M = 3.97$, $SD = 0.942$), use of energy-efficient technologies ($M = 3.92$, $SD = 0.812$), and management support ($M = 3.93$, $SD = 0.948$), also scored highly. Comparatively lower ratings were observed for monitoring and tracking GHG emissions ($M = 3.52$, $SD = 1.082$) and the setting of clear GHG

emissions reduction targets ($M = 3.71$, $SD = 1.172$). The standard deviations ranged from 0.746 to 1.172, suggesting moderate variability in adoption levels across the surveyed establishments.

Social Sustainability Initiatives and the Adoption of Zero GHG Emission Practices

Factor analysis was conducted to establish the underlying dimensions of social sustainability initiatives. The analysis comprised participants' responses across 20 Likert scale items. Table 2 summarises the results of the suitability of factor analysis given the data on social sustainability initiatives.

Table 2: Suitability of Factor Analysis for Measures of Social Sustainability Initiatives

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy.	0.560
Bartlett's Test of Sphericity	Approx. Chi-Square
	df
	Sig.
	874.246
	190
	<0.001

As shown, the KMO value of 0.560 revealed sampling adequacy for factor analysis. Besides, the Bartlett's Test of Sphericity $X^2 = 874.246$ was statistically significant ($p < 0.001$). This indicated that correlations between the measurement items were adequate for factor analysis. Together, the two tests highlighted the suitability of factor analysis given the data in this research.

Furthermore, the underlying components were extracted using the Principal Component Analysis approach with Varimax rotation. The Kaiser criterion of considering factors with an eigenvalue greater than 1 was followed. Following this approach, seven (7) components were extracted (Table 3).

Table 3: Explained Variance by Components of Environmental Sustainability Initiatives

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.465	27.326	27.326	5.465	27.326	27.326	2.786	13.931	13.931
2	2.458	12.288	39.614	2.458	12.288	39.614	2.427	12.134	26.065
3	1.959	9.795	49.409	1.959	9.795	49.409	2.399	11.993	38.058
4	1.711	8.555	57.964	1.711	8.555	57.964	2.277	11.386	49.444
5	1.370	6.850	64.814	1.370	6.850	64.814	1.977	9.884	59.328
6	1.227	6.134	70.948	1.227	6.134	70.948	1.947	9.737	69.065
7	1.122	5.610	76.557	1.122	5.610	76.557	1.499	7.493	76.557
8	1.000	5.000	81.557						
9	.743	3.714	85.271						
10	.570	2.852	88.122						
11	.518	2.588	90.710						
12	.431	2.153	92.863						
13	.301	1.505	94.368						
14	.298	1.490	95.859						
15	.229	1.146	97.004						
16	.200	1.000	98.004						
17	.163	.814	98.818						
18	.118	.591	99.409						
19	.076	.379	99.787						
20	.043	.213	100.000						

Notes: Extraction Method: Principal Component Analysis.

The 7 components explained approximately 76.56% of the variance in the dataset, which superseded the suggested minimum variance of $\geq 60\%$, showing a strong variance for organisational studies. To improve the interpretation of components, Varimax rotation with Kaiser normalisation was employed. Components 8 to 20 with eigenvalues < 1 were not considered because of their minimal contribution to the underlying

components. The percentage of variances under the Rotated Sums of Squared loadings revealed component 1 as the strongest underlying factor accounting for about 13.93% of variance, followed by component 2 (12.13%), 3 (11.99%), 4 (11.39%), 5 (9.88%), 6 (9.74%), and 7 (7.49%) respectively. Furthermore, the rotated matrix grouped significant items with loadings exceeding

0.5 under each component with thematic explanation (Table 4).

As shown, 4 items loaded highly on component 1 and were named *Community Partnership and Guest Awareness*. This factor reflects the establishments' active partnerships with local communities and efforts to increase guest awareness regarding social sustainability issues. Component 2 was named *NGO Collaboration and Guest Participation*. It depicts collaborations with

NGOs and encourages guests to get involved in local community activities. Component 3 was named *Local Sourcing and Economic Support*. It emphasises the organisation's commitment to supporting local economies by obtaining and procuring materials locally. Component 4 was named *Local Hiring and Workplace Safety*. It focuses on providing locals with employment opportunities and ensuring a safe work environment.

Table 4: Rotated Matrix for Social Sustainability Initiatives

Factor and Measurement Items	Component						
	1	2	3	4	5	6	7
<i>Factor 1: Community Collaboration and Guest Awareness</i>							
Actively engage with local communities to understand their needs.	.453	.314	-	.118	.201	.440	.367
Information about local social issues is shared with our guests to raise awareness.	.764	.130	-	.038	.062	.087	.360
Partners with local organisations to support social and environmental goals.	.787	.314	-	.115	-	.098	-.111
The organisation collaborates with community leaders to address local challenges.	.797	-	.269	.115	.118	.039	-
		.160					.057
<i>Factor 2: NGO Collaboration and Guest Participation</i>							
The organisation collaborates with NGOs to support social and environmental initiatives.	-	.710	-	.142	.057	-	.429
	.043		.025			.134	
The organisation regularly assess social impact on the community.	.589	.605	.270	.006	.205	-	-
						.182	.093
The organisation encourages guests to participate in local community activities.	.223	.776	.136	-	-	.260	-
				.150	.131		.094
<i>Factor 3: Local Sourcing and Economic Support</i>							
Source food and materials from local suppliers.	-	-	.757	.145	.229	.473	-
	.010	.133					.065
Purchasing policies favour local businesses to boost the regional economy.	.007	.057	.822	.143	-	.116	.351
					.092		
The organisation has a social responsibility policy in place.	.239	.419	.722	.037	.260	-	.003
						.087	
<i>Factor 4: Local Hiring and Workplace Safety</i>							
The organisation prioritises hiring locals for various positions.	.133	-	.107	.864	-	.163	.203
		.156			.048		
The organisation provides guests with information about local heritage and cultural practices.	.400	.330	-	.593	.216	.253	-
			.097				.312
Ensures a safe and healthy working environment for all employees.	-	.009	.195	.823	.105	-	.093
	.018					.171	
<i>Factor 5: Staff Development and Training</i>							
Offers training programs for local staff to enhance their skills.	.104	.120	-	.190	.801	.108	.052
			.058				

Factor and Measurement Items	Component						
	1	2	3	4	5	6	7
The organisation provides opportunities for career advancement for employees from the local community.	.042	.000	.383	.045	.689	.207	.100
Regular safety training is provided to all staff members.	.098	-	.103	-	.558	-	.305
		.153		.078		.472	
<i>Factor 6: Community Contributions</i>							
The organisation supports community event initiatives.	.072	-	.185	-	.066	.793	.080
		.074		.055			
Contributes to local charitable organisations and community projects.	.246	.392	.305	.159	.343	.588	-
							.169
<i>Factor 7: Employee Welfare</i>							
Provide fair wages and benefits to local employees.	.060	.074	.263	.226	.223	.020	.772

Notes: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation.

Component 5 was named *Staff Development and Training* and reflects the organisation's efforts to train and develop local staff for career progression. Component 6 was named *Community Contributions*. This component focuses on direct support to local communities through events and benevolent activities. Component 7 was named *Employee Welfare* and reflects organisational

commitment to fair compensation and benefits for employees, particularly locals.

Descriptive Results of Social Sustainability Initiatives

The descriptive results of participants' responses on various items measuring social sustainability initiatives organised in terms of the extracted factors are summarised in Table 5.

Table 5: Descriptive Results of Social Sustainability Initiatives

Factor and Measurement Items	Mean	Std. Dev
<i>Factor 1: Community Collaboration and Guest Awareness</i>		
Actively engages with local communities to understand their needs.	4.15	0.54
Information about local social issues is shared with our guests to raise awareness.	4.11	0.61
Partners with local organisations to support social and environmental goals.	3.97	0.75
The organisation collaborates with community leaders to address local challenges.	3.89	0.61
<i>Factor 2: NGO Collaboration and Guest Participation</i>		
The organisation collaborates with NGOs to support social and environmental initiatives.	4.03	0.75
Regularly assess social impact on the community.	3.95	0.90
Encourage guests to participate in local community activities.	4.08	0.63
<i>Factor 3: Local Sourcing and Economic Support</i>		
Source food and materials from local suppliers.	4.04	0.81
Purchasing policies favour local businesses to boost the regional economy.	4.05	0.66
The organisation has a social responsibility policy in place.	4.18	0.69
<i>Factor 4: Local Hiring and Workplace Safety</i>		
The organisation prioritises hiring locals for various positions.	4.29	0.70
The organisation provides guests with information about local heritage and cultural practices.	4.16	1.00
Ensure a safe and healthy working environment for all employees.	4.29	0.80
<i>Factor 5: Staff Development and Training</i>		
Offer training programs for local staff to enhance their skills.	4.12	0.69

Factor and Measurement Items	Mean	Std. Dev
The organisation provides opportunities for career advancement for employees from the local community.	4.16	0.50
Regular safety training is provided to all staff members.	4.29	0.57
<i>Factor 6: Community Contributions</i>		
The organisation supports community event initiatives.	4.01	0.61
The organisation contributes to local charitable organisations and community projects.	4.05	0.80
<i>Factor 7: Employee Welfare</i>		
Provide fair wages and benefits to our local employees.	4.15	0.62
Notes: N = 73. Scale (<i>Range of Means Interpretation</i>): 1 = <i>Strongly Disagree</i> (SD) (1.00 – 1.79), 2 = <i>Disagree</i> (D) (1.80 – 2.59), 3 = <i>Neutral</i> (N) (2.60 – 3.39), 4 = <i>Agree</i> (3.40 – 4.19), 5 = <i>Strongly Agree</i> (4.20 – 5.00)		

As shown, the mean scores across all the measurement items ranged from 3.89 to 4.29. Based on the ranges for interpreting means, this finding demonstrated participants' consistent agreement with the implementation of social sustainability initiatives. However, a strong agreement was found in 'career advancement opportunities for local employees', which was depicted by the lowest variation ($SD = 0.50$). The highest mean score of 4.29 occurred in three items: 1) local hiring, 2) safe working environments, and 3) staff safety training. This emphasised these measurement items as key strengths among social sustainability initiatives. With respect to Factor 1 (Community Collaboration and Guest Awareness), results show that organisations in this study actively develop collaborations with communities and provide guests with information about social and environmental concerns. Participants strongly agreed with engaging local communities ($M = 4.15$, $SD = 0.54$) and raising awareness among guests concerning social sustainability issues ($M = 4.11$, $SD = 0.61$). Collaboration with local organisations ($M = 3.97$, $SD = 0.75$) and community leaders ($M = 3.89$, $SD = 0.61$) was also notable. These findings reflected robust partnerships and social networks.

Regarding Factor 2 (NGO Collaboration and Guest Participation), participants reported strong collaborations with NGOs ($M = 4.03$, $SD = 0.75$). Participants also indicated that organisations were involving guests in local activities ($M = 4.08$, $SD = 0.63$). Besides, social impact assessments were

moderately rated ($M = 3.95$, $SD = 0.90$). This demonstrated opportunities for enhanced measurement and reporting. Concerning Factor 3 (Local Sourcing and Economic Support), emphasis was placed on sourcing from local suppliers ($M = 4.04$, $SD = 0.81$) and supporting the regional economy ($M = 4.05$, $SD = 0.66$). In addition, participants affirmed the presence of social responsibility ties ($M = 4.18$, $SD = 0.69$). This finding depicted formalised approaches to socio-economic sustainability.

Concerning Factor 4 (Local Hiring and Workplace Safety), local hiring ($M = 4.29$, $SD = 0.70$) and workplace safety ($M = 4.29$, $SD = 0.80$) were scored the highest. Sharing cultural and heritage information with guests ($M = 4.16$, $SD = 1.00$) also received strong agreement, although with higher variability, demonstrating differences in implementation across organisations. About Factor 5 (Staff Development and Training), training for local staff ($M = 4.12$, $SD = 0.69$) and career advancement opportunities ($M = 4.16$, $SD = 0.50$) were well-supported. Besides, the presence of regular safety training was highly rated ($M = 4.29$, $SD = 0.57$). This showed a strong commitment to continuous professional development.

Relating to Factor 6 (Community Contributions), support for local events ($M = 4.01$, $SD = 0.61$) and charitable contributions ($M = 4.05$, $SD = 0.80$) showed higher levels of community engagement and organisational corporate social responsibility. As regards Factor 7 (Employee Welfare), fair wages and benefits for local employees were

affirmed by participants ($M = 4.15$, $SD = 0.62$). This finding depicted organisational attention to equity and employee well-being.

Test of Hypothesis

The hypothesis (H_0) suggested that social sustainability practices have no significant effect

on the adoption of zero GHG emission practices. A multiple linear regression analysis was conducted to examine whether the 7 components of social sustainability initiatives significantly explained the adoption of zero GHG emission practices. The results are reported in Table 6.

Table 6: Multiple Regression Analysis – Impact of Social Sustainability Practices on Adoption of Zero GHG Emission Practices

Predictor	B	SE	β	t	Sig.
(Constant)	0.497	0.639		0.777	0.440
Community Collaboration and Guest Participation	0.129	0.152	0.081 ^{n.s}	0.847	0.400
NGO Collaboration and Guest Participation	0.510	0.111	0.406***	4.594	<0.001
Local Sourcing and Economic Support	0.794	0.112	0.642***	7.074	<0.001
Local Hiring and Work Safety	0.307	0.104	0.247***	2.944	0.004
Staff Development and Training	0.188	0.142	0.107 ^{n.s}	1.322	0.191
Community Contributions	0.038	0.109	0.031 ^{n.s}	.349	0.728
Employee Welfare	0.177	0.100	0.146 ^{n.s}	1.763	0.083

Notes: a. Dependent Variable: Adoption of Zero GHG Emission Practices. $R = 0.826$. $R^2 = 0.682$. Adj. $R^2 = 0.648$, S.E. = 0.44289. $F(df = 7, 65) = 19.957$. $p < 0.001$. Significance: ** $p < 0.05$. *** $p < 0.001$. n.s. – not significant.

Results show that the overall regression model was statistically significant ($F[7,65] = 19.957$, $p < 0.001$) and accounted for about 68.2% of the variance in zero GHG emission adoption ($R^2 = 0.465$). The effects of the three (3) components were statistically significant ($p < 0.05$). These predictors comprised NGO Collaboration and Guest Participation ($\beta = 0.406$, $p < 0.001$), Local Sourcing and Economic Support ($\beta = 0.642$, $p < 0.001$), and Local Hiring and Work Safety ($\beta =$

0.247, $p = 0.004$). Four (4) components including Community Collaboration and Guest Awareness ($\beta = 0.081$, $p = 0.400$), Staff Development and Training ($\beta = 0.107$, $p = 0.191$), Community Contributions ($\beta = 0.031$, $p = 0.728$) and Employee Welfare ($\beta = 0.146$, $p = 0.083$) were not significant predictors in the regression model. The regression equation derived from the model is as follows:

\hat{Y} (Zero GHG Emission Adoption)

$$= 0.497 + 0.129(\text{Community Collaboration and Guest Awareness}) \\ + 0.510(\text{NGO Collaboration and Guest Participation}) \\ + 0.794(\text{Local Sourcing and Economic Support}) \\ + 0.307(\text{Local Hiring and Work Safety}) + 0.038(\text{Community Contributions}) \\ + 0.177(\text{Employee Welfare})$$

Based on the regression results, H_0 was rejected, showing that social sustainability initiatives have an impact on the adoption of zero GHG emission practices. The results demonstrated that initiatives closely connected to external partnership (such as collaborating with NGOs and engaging guests) and economic localisation strategies (such as sourcing locally and ensuring local employment

and safety) are strong drivers of zero GHG emission practices. These factors were significant because external collaborations, most of the time, bring technical knowledge, funding, and credibility to sustainability initiatives. Besides, practices related to supporting the local economy build resilient and low-carbon supply chains that may help reduce transportation emissions.

Contrastingly, organisation-based practices such as staff development, community donations, and employee workplace safety and welfare did not significantly predict GHG reductions. This finding may be because while the importance of these practices to organisational health cannot be overlooked, they do not directly influence the operational or technological shifts required to eliminate GHG emissions. The results of this study corroborated those of Darwesh (2023), who underlined the importance of social sustainability practices among hospitality establishments. Consistent with the tenets of the stakeholder theory, the findings of this study imply that organisations in this study with the intention of reducing GHG emissions should focus more on strengthening linkages with NGOs, involving guests in sustainability initiatives, sourcing goods and services locally, and ensuring local employment and workplace safety. While organisational social initiatives are important, they may not alone be adequate to drive major social sustainability performance enhancements.

CONCLUSIONS

Several conclusions are derived from the results of objective two. The first conclusion is that social sustainability practices are broadly implemented and positively perceived within eco-lodge operations. The second conclusion is that three important factors comprising NGO collaboration and guest participation, local sourcing and economic support, and local hiring and work safety significantly and positively influence the adoption of zero GHG emission practices. Lastly, other social factors such as staff training and employee welfare, though present, may not directly influence the adoption of zero GHG emission practices among lodges and tented camps.

Implications for Practice

For eco-lodge operators in this study, the study recommends that they deepen collaborations with NGOs and local communities to co-create sustainability programs involving guests. They also need to formalise local sourcing policies and maintain transparent tracking of purchases to

encourage local economies and reduce emissions. Besides, they can institutionalise workplace safety and prioritise recruiting and hiring members of the neighbouring communities, aligning human resource policy with sustainability goals. In addition, the study recommends that the government, through the Ministry of Tourism and Wildlife and agencies to provide incentives for lodges demonstrating strong NGO collaboration and local sourcing. These entities need to establish local supply chain certification schemes to support tourism-related sustainability. Besides, they can facilitate public-private partnerships that fund or co-manage community projects aligned with zero-emission tourism. For tourism industry associations, there is a need to develop guidelines and benchmarks for socially responsible practices that directly support GHG emission reduction. These associations can also offer training and capacity-building for member lodges on engaging with NGOs and sourcing locally.

Limitations and Suggestions for Future Research

This study was conducted among lodges within the Southern Tourism Circuit of Kenya. Thus, future research should explore the adoption of zero GHG emission practices in a broader beyond this scope to assess the generalizability of the findings. Future studies can explore cross-country comparisons in East Africa to understand regional best practices and challenges in adopting zero GHG emissions in nature-based tourism. Besides, future studies can adopt a longitudinal approach to observe how the adoption of zero GHG emission practices evolves in lodges and camps, and to assess the long-term impact of social sustainability initiatives. Such studies will also help in tracking the progression of sustainability initiatives and measuring their actual reductions in GHG emissions.

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