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Research Article

Workplace Safety and Sustainable Practices as Predictors of Staff Health and Business Performance in Kaduna's Hospitality Industry

Asiyatu Ibrahim [a], Yahya Saleh Ibrahim [b]

[a] Department of Hospitality Management Technology, Kaduna Polytechnic, Kaduna, Nigeria. [b] Department of Geography and Sustainability Studies, Kaduna State University, Kaduna, Nigeria.

ABSTRACT

The hospitality industry is a significant employer, yet it often features challenging working conditions. While sustainable practices are being increasingly adopted, their direct influence on key operational outcomes, such as staff productivity and business performance, remains poorly quantified, especially in developing urban contexts. This study addresses this gap by quantitatively analysing data from 349 staff and management organizations across hotels, guesthouses, and restaurants in Kaduna Metropolis, Nigeria. Using descriptive statistics, regression analysis, and correlation analysis, the study investigates the effects of workplace safety practices on staff productivity and business performance, as well as the relationships between broader sustainable practices and staff health and safety. The results reveal a strong positive relationship, with workplace safety practices accounting for 52.7% (R^2 = 0.527) of the variation in staff productivity and 49.3% (R^2 = 0.493) of the variation in business performance. Furthermore, a significant positive correlation was found between sustainable practices and staff health and safety (the correlation coefficient ranged from 0.54 to 0.68, $p<0.001$). The regression model indicated that sustainable practices explained 61% of the variation in health and safety outcomes (R^2 = 0.61). The findings suggest that sustainability is not merely a cost or a marketing tool but also a strategic driver of employee well-being, efficiency, and competitive advantage. The study concludes by recommending that hospitality managers prioritize safety training and equipment and integrate comprehensive sustainability practices such as waste management and energy efficiency to achieve tangible improvements in both human capital and business capital.

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1 Introduction

The hospitality industry remains a critical driver of global economic activity, contributing significantly to employment, income generation, and international trade. According to the United Nations World Tourism Organization (UNWTO, 2023), the sector accounted for more than 10% of the global GDP before the COVID-19 pandemic and continues to recover with an increasing emphasis on sustainability. As environmental awareness increases, hospitality businesses are increasingly integrating sustainable practices, such as energy-efficient infrastructure, eco-friendly waste management, and improved workplace safety systems, to ensure long-term operational viability and social responsibility (Prakash et al., 2023). These evolving practices are not only environmentally driven but also increasingly recognized as essential for enhancing employee well-being and organizational performance.

However, the discussion on sustainability has moved from the environment to incorporate workplace safety and health, which are key but often neglected components of success (Adesua-Lincoln, 2025). The hospitality industry is notorious for high staff turnover and poor working conditions, which can impact the productivity of employees and, consequently, the success of the business (Ibrahim et al., 2025). In this context, the application of sustainable practices in the workplace, such as ventilation, reduced use of noxious cleaning agents, and design for comfort, is key to reducing workplace hazards and enhancing the health of employees (Olalekan et al., 2023). Today, more than ever before, this is related not only to the health and productivity of employees but also to the success of the business through satisfied customers.

Globally, the drive for the integration of sustainability in the hospitality industry's operations can be attributed to concerns over the environment, regulations, and increased consumer expectations, as highlighted in the Sustainable Development Goals (Sharma et al., 2024). Although countries in the developed world have made tremendous progress in adopting green technology and other safety-enhancing technologies, countries in the developing world, especially in Africa, still face a number of challenges, which have affected the implementation of workplace safety (Atofarati et al., 2025).

However, the implementation of sustainability and safety-oriented practices is still inconsistent in many developing countries, such as those in Africa. For instance, research carried out in Kenya and Ghana has indicated that while sustainability has improved aspects such as water conservation and environmental friendliness,

Corresponding Author: Asiyatu Ibrahim asiyatuibrahim@gmail.com Department of Hospitality Management Technology, Kaduna Polytechnic, Nigeria.
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countries still lack aspects such as training and occupational safety (Adesua-Lincoln, 2025; Ndasauka, 2024). These are the factors that undermine the role of sustainability in improving employee health. Nevertheless, research has indicated that organizations that implement sustainability and training and safety practices are more successful in terms of aspects such as customer satisfaction and cost (Abdou et al., 2020).

In the case of Nigeria, the hospitality industry is still growing rapidly, driven by factors such as urbanization, business travel, and domestic tourism (Ojo & Mejabi, 2024). Although the benefits of sustainable tourism have been recognized as a tool for national development through the creation of jobs and the conservation of the environment (Ndalnamu et al., 2024), its implementation has been inconsistent (Ofem et al., 2024). Small and medium-scale hospitality businesses show a low level of compliance with work safety regulations and practices, making workers vulnerable to occupational hazards and negatively affecting their productivity.

Kaduna Metropolis is one of the urban and administrative centers in northwestern Nigeria. Although the hospitality industry has been growing rapidly, driven by the expansion of hospitality businesses, including hotels and other small-scale establishments, the industry still faces various challenges, including poor safety regulations, poor waste disposal practices, and the use of outdated facilities (Ibrahim et al., 2022). This not only affects workers' health but also negatively influences the performance of businesses through the impact on workers' productivity and customer satisfaction.

However, despite the increasing awareness of the importance of safety and sustainability at the workplace, most empirical research in Nigeria has concentrated on wider regions, with little attention given to the Kaduna Metropolis (Babagbale, 2020). The literature on the Kaduna Metropolis has largely concentrated on the issue of occupational hazards and the lack of safety culture (Aliyu & Rogo, 2022), but has not fully explored the impact of sustainable culture and workplace safety on the health of employees and businesses as a whole. The literature on wider Nigerian regions (Obiora & Okonkwo, 2023; Oluwaseun & Eze, 2020) has also not fully explored the operational and infrastructural aspects of the hospitality industry in Kaduna or the impact of business size on safety and sustainability culture.

Given that a majority of hospitality enterprises in Kaduna operate in an environment that subjects employees to health risks such as ventilation, waste disposal, and safety equipment (Aliyu & Rogo, 2022), there is an urgent need for an assessment of how safety and sustainable practices could mitigate such risks, thereby enhancing organizational outcomes. However, in addition to descriptive studies, empirical studies that quantify the role of safety and sustainability in enhancing hospitality outcomes in a resource-constrained urban environment are lacking.

This study aims to quantitatively examine the influence of workplace safety and sustainable practices on staff health and business performance in Kaduna Metropolis. Specifically, it seeks to (i) assess the effect of workplace safety on productivity and business performance and (ii) evaluate the relationship between sustainable practices and staff health outcomes.

2 Materials and Methods

2.1 Study Area

Kaduna Metropolis is located between latitudes 10° 25' 0" N and 10° 35' 30" N of the equator and longitudes 7° 22' 30" E and 7° 30' 30" E of the Greenwich Meridian. Kaduna metropolis is located in the northern part of Nigeria. The study area spans the Kaduna North and Kaduna South Local Government areas, as well as parts of the Igabi and Chikun Local Government areas.

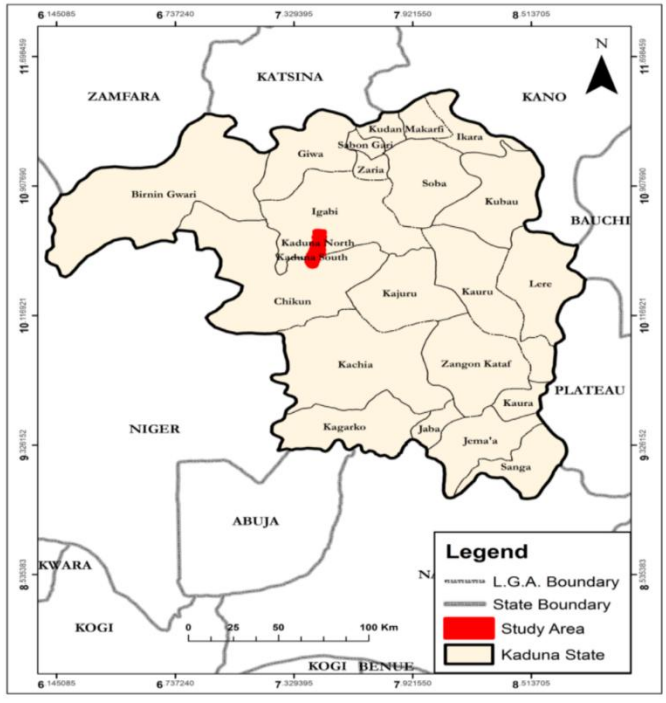


Figure 1: Study area
Source: Modified from GRID3 – Nigeria, 2025

The Kaduna Metropolis has alternating wet and dry seasons. The wet season normally starts in April and increases gradually to its peak in August. It then declines by September and ceases by the end of October, with an average annual rainfall of approximately 1,350 mm (Ojonuba et al., 2025). The maximum temperature often increases to approximately 38 °C between March and April. It may decrease significantly to approximately 24 °C or less during the peak rainy period (July/August) and

during the cold, dry north-easterlies or harmattan winds (November/February) (Yisa et al., 2019). The mean annual temperature in Kaduna State exceeds 34 °C during the hottest months (March–April) (Abubakar et al., 2025).

The study area is drained by the Kaduna River and its major tributaries, namely, the Rigachikun and Romi Rivers. The Kaduna River crosses the town, dividing it into northern and southern areas. The soils are typically red–brown to red–yellow tropical ferruginous soils. The vegetation of the Kaduna metropolis falls within the northern subzone of the Guinea Savanna, characterized by savanna-type vegetation, but is affected by numerous human activities, including construction and fuelwood demand (Musa & Abubakar, 2024). Kaduna metropolis is a trade center and a major transportation hub for the surrounding agricultural areas with its rail and road junction. The projected population of the Kaduna metropolis for 2023 stood at 1,913,526 (Umar et al., 2025).

2.2 Types and sources of data

The data were collected through structured questionnaires to enable quantitative analysis and detailed insights.

Table 1: Types, Sources, and Relevance of Data

S/N	Data Needed	Source of the Data	Relevance/Use of the Data
1	Types of sustainable practices adopted by hospitality businesses	Primary data from employees of hospitality businesses	Nature and range of sustainable practices implemented in the hospitality sector
2	Impact of sustainable practices on the physical health of staff	questionnaires and interviews with hospitality staff	Operational sustainability measures influence the physical health of employees
3	Effect of sustainable practices on workplace safety	Primary data from safety officers, frontline staff, and management through surveys and observation	Effects of sustainable practices on safety procedures, risk reduction, and injury prevention

2.3 Sample size and sampling technique

The target population comprises hospitality businesses in Kaduna Metropolis (hotels, restaurants, and guesthouses) and their staff. Two categories of respondents are considered: management staff, to provide insights into sustainable practices and policies, and operational staff, to capture perceptions and experiences of workplace health and safety. The sample size is determined using Cochran's formula (1977) for large populations. This is given in Equation (1):

$$n_0 = \frac{Z^2 pq}{e^2} \quad (1)$$

where n_0 = sample size, Z = confidence level (1.96 at 95%), p = estimated proportion of the population with the attribute (0.5 assumed for maximum variability), q = 1 – p, and e = margin of error (0.05)

This yields a minimum of 384 respondents, adjusted proportionally to reflect the staff strength of each stratum (wards and staff categories). The study used stratified convenience sampling. Owing to nonresponse and field constraints, 349 valid responses were obtained and used for analysis.

2.4 Method of Data Analysis

Descriptive statistics were used to analyse the sociodemographic characteristics of the respondents, and their perceptions of workplace safety and productivity using a 5-point Likert scale. Multiple linear regression was used to test the association between safety practices and perceived business performance. Additionally, the Pearson correlation coefficient was used to examine the relationship between sustainable practices and staff health/safety measures. Similarly, multiple linear regression analysis was used to test how sustainability adoption predicts staff health and safety outcomes. Staff productivity and business performance were treated as the dependent variables, while workplace safety indicators (training, equipment, and inspections) served as the independent variables. Analysis was conducted using SPSS version 28.

2.5 Ethical Approval

Ethical approval was obtained from the institutional review board. Informed consent was secured from all participants, and confidentiality was strictly maintained through anonymous coding of responses. Participation was voluntary, with the right to withdraw at any time.

3 Results and Discussion

3.1 Sociodemographic Characteristics of the Respondents

The data in Table 2 show that most respondents were women. Among the 349 participants, 201 (57.6%) were women, and 148 (42.4%) were men. This shows that fewer men than women worked in the hotel industry in Kaduna Metropolis. This suggests that the industry may hire or attract more women than men.

Table 1: Sociodemographic Characteristics of the Respondents

Gender	Frequency	Percentage
Male	148	42.4
Female	201	57.6
Age		
Under 20	11	3.2
20–29	175	50.1
30–39	102	29.2
40–49	33	9.5
50+	28	8.0
Education		
Informal	27	7.7
Primary	40	11.5
Secondary	133	38.1
Tertiary	149	42.7
Years of Experience		
<1	7	2.0
1–3	75	21.5
4–6	105	30.1
7–10	103	29.5
10+	59	16.9
Total	349	100.0

The age profile of the respondents reveals that most workers in the hotel industry in Kaduna are young. Moreover, more than half of the participants (50.1%) were between the ages of 20 and 29, and 29.2% were between the ages of 30 and 39. A total of 9.5% of the people were between 40 and 49 years old, and just 8.0% were 50 years old or older. Only a tiny percentage (3.2%) were under 20 years old. This trend shows that most people who work in hospitality are young. This is because a hospitality job is typically physically demanding and requires energy, flexibility, and adaptability.

The results suggest that most respondents had extensive formal schooling. Approximately 42.7% went to college, while 38.1% finished high school. A smaller percentage received primary education (11.5%), while only 7.7% had no formal schooling. This finding shows that hospitality enterprises in Kaduna attract reasonably educated staff, with a large number having postsecondary credentials, which may contribute favourably to service delivery and the adoption of workplace innovations.

The distribution of work experience suggests that the sector benefits from a combination of fresh entrants and long-serving staff. The largest group (30.1%) had between 4 and 6 years of expertise, closely followed by those with 7 and 10 years (29.5%). Another 21.5% had 1–3 years of experience, while 16.9% had more than 10 years of experience. Only a small minority (2.0%) were new employees with less than one year of experience. This balance shows that the hospitality sector in Kaduna retains a considerable number of experienced professionals while also providing opportunities for newcomers, which may encourage both continuity and creativity within enterprises.

3.2 Perceptions of employees of workplace safety in hospitality businesses

Table 3 presents employees' perceptions of workplace safety practices adopted by hospitality businesses in Kaduna Metropolis.

Table 2: Employees' perceptions of workplace safety in hospitality businesses

Statement	SD	D	N	A	SA	Mean
Workplace safety training (fire safety, first aid, infection control) is regularly provided.	7	21	50	149	122	4.03
Safety equipment (fire extinguishers, PPE, first aid kits) is adequately available	8	19	48	161	113	4.01
Safety inspections and emergency drills are conducted frequently in my workplace	21	47	70	121	90	3.61
Workplace safety practices have improved staff productivity.	7	25	53	171	93	3.91
Workplace safety contributes positively to customer satisfaction and business performance.	5	21	47	128	148	4.13

The data in Table 3 reveal that most respondents agreed or strongly agreed (77.7%) that their workplace provides frequent safety training, such as fire safety, first aid, and infection control (mean = 4.03). Only a small proportion (8%) indicated dissent, while 14% remained indifferent. This implies that training is widely acknowledged as a critical element of workplace safety, but there remains room for improvement in ensuring uniformity across institutions. The majority of the respondents (78.6%) confirmed the availability of safety equipment, including fire extinguishers, PPE, and first-aid kits (mean = 4.01). Fewer than 8% disagreed, while 13.8% were neutral. This demonstrates a high level of compliance with safety equipment standards, which is consistent with the findings of Ada et al. (2025), who reported that most individuals and organizations prioritize equipping their facilities effectively.

The safety inspections and emergency exercises recorded the lowest mean value (3.61), with just 60.5% reporting that they are routinely performed. Approximately 19.5% disagreed, while another 20.1% were neutral. These findings suggest a relative deficit in the regular enforcement and monitoring of safety standards, as inspections and exercises appear less consistent than training or equipment supplies. The mean influence of workplace safety practices on staff productivity was 3.91, indicating that 75.7% of the respondents felt that workplace safety policies increase staff productivity. Only 9.2% disagreed, while 15.2% were neutral. The positive perception shows that safety is not just a preventive measure but also helps to improve efficiency and enhance work outcomes.

With respect to the contribution of workplace safety to customer satisfaction and business performance, the mean value was 4.13, with 79% of the respondents believing that workplace safety positively improves customer satisfaction and overall business performance. Very few respondents disagreed (7.5%), while 13.5% were neutral. This research aligns with Bautista-Bernal et al. (2024) in viewing safety as both an internal and an external value driver, increasing staff well-being while also promoting customer trust and loyalty.

3.3 Influence of workplace safety on staff productivity

The results of a linear regression examining the influence of workplace safety on staff productivity are presented in Table 4.

Table 3: Linear Regression Model Summary on the Influence of Safety on Productivity

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	0.726	0.527	0.521	0.58

The data in Table 4 reveal a strong and statistically significant association between workplace safety measures (training, equipment availability, and inspections/drills) and staff productivity. The R^2 value of 0.527 indicates that approximately 52.7% of the variance in staff productivity is explained by the combination of safety training, safety equipment, and safety inspections. The low standard error of the estimate (0.58) suggests that the projected values are reasonably close to the observed values, demonstrating strong model accuracy. These results align with the findings of Mutegi et al. (2023), who show that workplace safety measures have a considerable effect on worker productivity.

3.4 Influence of workplace safety on business performance

Table 5 presents the results of a linear regression that examines the influence of workplace safety on business performance.

Table 4: Model Summary on the Influence of Safety on Business Performance

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	0.702	0.493	0.487	0.61

The data in Table 5 indicate a strong, significant association between workplace safety practices and corporate performance outcomes. The R^2 score of 0.493 implies that the same set of safety policies explains 49.3% of the variance in customer satisfaction and business performance. This aligns with the findings of Mutegi et al. (2023), who reported that the deployment of workplace safety measures significantly improves business outcomes, notably customer satisfaction and overall organizational success.

3.5 Relationship between sustainable practices and staff health and safety in the Kaduna Metropolis businesses

Table 6 presents the relationships between the sustainable practices and the overall health and safety of staff in the Kaduna Metropolis.

Table 5: Relationships between sustainable practices and staff health and safety

Statement	SD	D	N	A	SA	Mean
Sustainable practices in my workplace contribute to fewer workplace accidents.	14	26	20	191	98	3.95
Proper waste management practices reduce health risks among staff.	5	18	11	201	114	4.15
Energy-efficient facilities (lighting, ventilation, equipment) create a safer and healthier working environment.	15	24	40	171	99	3.9
Sustainable practices, such as eco-friendly cleaning and sanitation, reduce staff absenteeism due to illness.	15	39	81	142	72	3.62
There is a strong relationship between sustainable practices and overall staff health and safety in my workplace.	13	33	54	171	78	3.77

The data in Table 6 show that the mean degree of agreement for "Proper waste management practices reduce health risks among staff" was 4.15, with 90.2% of the respondents agreeing or strongly agreeing that appropriate waste management minimizes health risks among personnel. This demonstrates considerable acceptance of waste management as a critical element of occupational safety. The statements "Sustainable practices in my workplace contribute to fewer workplace accidents" (mean = 3.95) and "Energy-efficient facilities create a safer and healthier working environment" (mean = 3.90) also indicate high agreement levels (82.8% and 77.4%, respectively). These results imply that personnel commonly acknowledge that sustainability measures, such as accident prevention and energy-efficient facilities, help generate safer working conditions.

The statement "There is a strong relationship between sustainable practices and overall staff health and safety in my workplace" (mean = 3.77) reveals that 71.3% of the respondents perceived a strong relationship between sustainable practices and overall staff health and safety. The statement "Sustainable practices such as eco-friendly cleaning and sanitation reduce staff absenteeism due to illness" (mean = 3.62) received the lowest level of agreement, with 61.3% of respondents believing that eco-friendly cleaning and sanitation reduce absenteeism due to illness. A stronger indifference response (23.2%) suggests that personnel are less convinced of the causal link between such behaviors and health outcomes, potentially because of inconsistent implementation. These findings validate the findings of Machingura and Muyavu (2024) that safety intervention practices improve sustainable performance.

3.6 Relationship between Sustainable Practices and Staff Health and Safety

Table 7 presents the results of the Pearson correlation coefficient to examine the relationships between sustainable practices and overall staff health and safety in the Kaduna Metropolis.

Table 6: Correlations between sustainable practices and staff health and safety

Variable	Staff Health & Safety	p value
Fewer workplace accidents	r = 0.62,	< 0.001
Waste management reduces risks	r = 0.68	< 0.001
Energy-efficient facilities	r = 0.59	< 0.001
Eco-friendly cleaning reduces absenteeism	r = 0.54	< 0.001

All four sustainable practices revealed strong, positive, and statistically significant associations with staff health and safety (Table 7). Proper waste management (r = 0.68) showed the strongest association, indicating that employees most clearly see it as directly minimizing health hazards. Eco-friendly cleaning/sanitation (r = 0.54) was the weakest, although still meaningful, link. This finding is in agreement with the findings of Chan & Hsu (2016), who argued that green certifications, such as energy conservation and eco-labelling, enhance both environmental performance and employee satisfaction.

3.7 *Influence of Sustainable Practices and Staff Health and Safety*

Table 8 presents the results of a multiple linear regression that examines the influence of sustainable practices on overall staff health and safety in the Kaduna Metropolis.

Table 7: Impact of Sustainable Practices and Staff Health and Safety

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate
1	0.781	0.61	0.604	0.482

The regression results in Table 8 show that sustainable practices have a strong positive influence on staff health and safety in the Kaduna Metropolis. The correlation coefficient (R = 0.781) indicates a strong relationship. In contrast, the coefficient of determination (R^2 = 0.61) indicates that approximately 61% of the variation in staff health and safety is explained by the sustainable practices organizations adopt. The adjusted R^2 (0.604), which is close to the R^2, confirms the model's reliability and indicates that the included predictors are relevant. Furthermore, the standard error of the estimate (0.482) suggests that the model's predictions are fairly accurate, with minimal deviation from the actual values. These findings align with those of Machingura and Muyavu (2024), who reported that sustainable practices contribute significantly to improving staff wellbeing and workplace safety in the study area.

4 Conclusion

The hospitality industry in Kaduna Metropolis remains a key economic driver but faces ongoing challenges related to staff health, safety, and performance because of poor working conditions and limited resources. This study provides robust empirical support for the view that workplace safety and sustainable practices are significant predictors of positive outcomes. The results of the regression analysis indicate that workplace safety practices (training, protective gear, inspections/drills) account for 52.7% of the variance in staff productivity (R^2 = 0.527) and 49.3% of the variance in business performance, including customer satisfaction (R^2 = 0.493). These findings confirm that safety investments directly improve efficiency, reduce absenteeism, and enhance service quality, offering clear benefits for operators. Sustainable practices, particularly waste management, energy-efficient facilities, and environmentally friendly operations, are strongly positively correlated with staff health and safety (r = 0.54–0.68; the strongest correlation is for waste management). Multiple regression indicated that these practices accounted for 61% of the variation in overall staff health and safety outcomes (R^2 = 0.61), underscoring their role in reducing accidents, health risks, and illness-related absenteeism.

In conclusion, sustainability and safety are not merely compliance or marketing tools but strategic necessities that protect human capital while enhancing organizational competitiveness in resource-limited settings such as Kaduna. The integration of these practices supports global SDGs and local occupational health policies, providing measurable benefits for employees and businesses alike.

This study has some limitations. The cross-sectional design limits causal inferences, and reliance on self-reported data may introduce social desirability bias. The sample was restricted to Kaduna Metropolis, reducing generalizability to other regions. Future research should employ longitudinal designs, include objective performance metrics, and conduct comparative studies across different Nigerian cities.

Based on the study's findings, the following recommendations are proposed.

i. Hospitality businesses in Kaduna Metropolis should institutionalize sustainability policies, maintain tight monitoring, and provide continual training for personnel to promote true and consistent adoption of sustainable practices.
ii. Management should perform frequent safety drills, inspections, and refresher training, in addition to

providing proper protective equipment, to foster a culture of safety that enhances staff productivity and customer satisfaction.

iii. Businesses should invest in eco-friendly cleaning materials, efficient waste management systems, and energy-efficient facilities, ensuring that sustainability directly translates into safer and healthier working environments for staff.

iv. Both business owners and policymakers should explore cost-sharing mechanisms, tax incentives, or subsidies to reduce the financial burden of implementing sustainable practices such as renewable energy adoption and advanced waste treatment systems.

v. Stronger partnerships between hospitality associations, government agencies, and NGOs should be encouraged to provide technical support, capacity building, and regulatory enforcement, ensuring that the sustainability practices in the sector are impactful and long-lasting.

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