Research Article

Development and Validation of Green Practices Framework for the Hospitality Industry: Input to Sustainable Tourism Policy

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Article Info

A B S T R A C T

This study focuses on fostering sustainable practices in Region XI, Philippines. Employing a mixed-methods research design, the study uses an exploratory sequential approach to gather insights from 650 hospitality employees. Face-to-face interviews were conducted with 50 participants, including experts and hotel and resort proprietors, during the qualitative phase of data collection. A survey questionnaire was administered to 300 rank-and-file employees to identify critical sustainability constructs. To guarantee representativeness across the hospitality workforce, stratified random sampling was implemented. To evaluate the components identified in the Exploratory Factor Analysis (EFA), an additional 300 respondents took part in the Confirmatory Factor Analysis (CFA). Stratified random sampling was used to guarantee representativeness across all levels of the hospitality profession. When taken as a whole, these stages aid in creating a thorough and useful framework for advancing sustainability in the local hospitality sector. The completed and verified building environmental rules and regulations, employee and management attitudes and actions, and adopting green practices make up the Green Practices Framework. Using the Practices Green Hospitality Framework, this research aims to promote economic development while maintaining ecological and cultural legacy. Its implications go out to politicians, companies, workers, and local communities. Region XI will have the opportunity to become a pioneer in sustainable tourism by implementing these suggestions, which will help create a hospitality business that is both competitive and ecologically conscious.

SDG Indicator: #12 (Responsible Consumption and Production) #8 (Decent Work and Economic Growth) #13 (Climate Action)

INTRODUCTION

The Philippines' hotel industry may benefit from implementing a Green Practices Framework to encourage adopting sustainable practices. This framework reflects a thoughtful reaction to the growing worldwide awareness of environmental issues and the imperative need for environmentally conscious tourism. It is recognized that the Philippines has a unique and complex ecology, and that it is essential to protect these benefits for future generations. The framework combines economic growth with ecological preservation and environmental protection by integrating green practices into the hospitality industry, particularly in Region XI. This encourages eco-friendly and nature-friendly tourism.

In the hotel business, there is a lack of standardization and inconsistency, as well as a disorganized and inconsistent framework for green practices, which leads to a rise in susceptibility and uneven implementation of sustainability ideas, lowering utility and integrity. The author (Mensah, 2006) defined criteria; enterprises like hotels and resorts, as well as certain businesses that supply services, may adopt methods that are cosmetic or "greenwashed," meaning that they do not produce actual environmental advantages (Delmas & Burbano, 2011). This may result in inefficient use of resources, waste that is not managed correctly, and the destruction of natural and cultural assets, which ultimately undermines the aims of long-term sustainability. Additionally, the absence of standardization leads to misunderstanding among stakeholders, restricts the capacity to compare practices across institutions, and makes it more difficult to implement environmental legislation (Graci & Dodds, 2008). Consequently, the inability of the tourist sector in Region XI and across the Philippines to adopt a uniform framework puts the industry's capacity to promote itself as a responsible and internationally competitive destination at risk.

Millions of tourists visit the Philippines yearly because of its unique biodiversity and wealth of natural resources. Its delicate ecosystems are under serious risk from the growing number of visitors and the industry's explosive expansion. Immediate action is required to address issues including overtourism-induced coral reef damage, excessive waste production, deforestation for infrastructure development, and increased energy and water consumption in the hospitality industry (UNEP, 2015; Fabinyi et al., 2016). Inadequate garbage disposal in coastal regions, the exhaustion of freshwater resources, and the increasing carbon emissions from hotel operations intensify the ecological issue (Gössling, 2002; Alampay, 2005). These difficulties highlight the pressing necessity for sustainable tourism practices and responsible hospitality management to save the nation's natural heritage.

The Green Hospitality Framework addresses environmental challenges by advocating for eco-friendly practices, including waste reduction, energy saving, sustainable sourcing, and responsible water consumption. It underscores the necessity of

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policy integration, industry collaboration, and customer awareness to promote enduring sustainability within the Philippine hospitality sector. This framework integrates sustainable practices into tourist operations, ensuring the competitiveness of the country's hospitality business while preserving its ecological resources for future generations. Furthermore, global greenhouse gas emissions are estimated to be generated by tourism activities at approximately 8 percent (Lenzen et al., 2018), with hotels being notably resource-intensive (Verma & Chandra, 2016). This underscores the importance of operational modifications in the hospitality industry.

Businesses and customers alike have taken a strong interest in sustainability, which has affected a number of sectors, including the hospitality sector (Han & Kim, 2010). To lessen their environmental impact, several hotels are responding by implementing eco-friendly procedures (Martínez García de Leaniz et al., 2018; Verma & Chandra, 2018). The goal of these procedures, which range from waste management to energy and water conservation, is to integrate environmental responsibility into regular hotel operations (Rahman et al., 2012).

Towel and linen reuse programs, low-flow fixtures, energy-saving devices, environmentally friendly items, and recycling activities are just some of the environmental measures that have been implemented. These reduce environmental impact and promote guest education and participation (Alonso-Almeida, 2017).

Researchers like Kasimu (2012) categorize green practices into four main groups: energy management, waste management, water conservation, and support for sustainable initiatives. These include solid waste and water management, energy efficiency, guest water-saving options, and biodiversity conservation. The authors (Legrand 2016 and Martínez García de Leaniz 2018) observed that environmental sustainability is increasingly being integrated into hotel marketing strategies. This shift is largely driven by the environmental consciousness of guests (Han, 2018).

The author (Cvelbar and Dwyer 2013) emphasizes the strategic importance of environmental and social responsibility for gaining competitive advantage and community support. Irani (2022) advocates for green human resource practices to engage employees in sustainability efforts, thereby enhancing overall hotel performance.

Philippine hotels are gradually embracing green practices in response to global calls for sustainability. Many establishments recognize the value of preserving the country's biodiversity through measures that promote responsible tourism (Alampay, 2005; Department of Tourism, 2020). Certification efforts yield cost savings while helping operators reduce environmental impacts through better energy, water, and waste management (UNEP, 2015; International Tourism Partnership, 2014). These improvements also enhance guest comfort through better air quality, access to daylight, and thermal control (USGBC, 2013; Bohdanowicz, 2006).

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A hotel's environmental commitment is reflected in its consistent application of green practices and staff-guest educational initiatives. Such efforts support global sustainability goals while enriching guest experience and preserving the Philippines' natural beauty and biodiversity (Galapate, 2019).

This study is anchored on several theories. The Green Innovation Theory contends that market pressures and environmental concerns drive the uptake of environmentally beneficial technology. Green technologies, including sustainable design, waste-reduction systems, and renewable energy, are encouraged in the hotel industry by consumer expectations and competitive pressures (Zameer et al., 2021). The study and application of successful sustainability strategies are supported by this theoretical framework.

The hospitality sector in Region XI continues to encounter sustainability challenges as a result of the absence of a standardized green practices framework, despite the growing awareness of the issue. Numerous establishments are oblivious of environmental initiatives, and existing policies are devoid of robust enforcement mechanisms. Fostering a more environmentally responsible tourism industry in the region necessitates bridging these gaps.

This study intends to address the following objectives: 1) The purpose of this study is to investigate the elements fundamental to the efficacy of environmental laws and regulations in the hospitality and tourist industry of Region XI, which is located in the Philippines.2) To develop a framework that illustrates the dimensions of policy enforcement and sustainability impact within the Green Hospitality Framework. These objectives assume that various internal and external factors affect the implementation and success of sustainability initiatives in the hospitality sector.

Another supporting theory, the Natural Resource-Based View (NRBV), argues that competitive advantage stems from effective natural resource management. In hospitality, energy efficiency, waste reduction, and sustainable sourcing improve operational efficiency and brand image while minimizing environmental impact (Hart, 1995). This theory further justifies the need for a strategic Green Practices Framework.

This research primarily focuses on identifying the factor structure of employee outcomes within the hospitality industry. It employs an exploratory methodology using a sequential mixed-method approach, starting with qualitative interviews followed by quantitative analysis.

Figure 1 presents the schematic model illustrating the multidimensionality of green practices. Key determinants include the adoption of green practices, employee and community engagement, management and staff perceptions, and environmental policies. These factors were identified through interviews and exploratory analysis and supported by the literature. The study aims to develop a new model that captures how various factors influence the implementation and effectiveness of sustainability policies in hospitality.

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The significance of this study lies in its contribution to sustainable development in Region XI's hospitality industry. It aligns with UN-SDG Goal 8 by proposing a structured Green Practices Framework that promotes eco-friendly initiatives while supporting economic growth and responsible tourism. The study enhances national efforts toward sustainability, benefits stakeholders, and strengthens local communities. Ultimately, it provides a foundation for future policies that harmonize ecological preservation with economic prosperity.

Figure 1: Conceptual Framework of the Study

METHOD

This section provides the method employed in the conduct of the study. It encourages research participants, materials, instruments, design, and procedure.

Research Participants

Hotels and Resorts Employees within Region XI, which covers Davao City, Panabo, Tagum, Mati, Samal City, and Digos City, have been identified as the focal locale for this research, encompassing a total of 650 employees who actively participated in the study.

This study employs a mixed-methods research design, incorporating both Qualitative and Quantitative approaches. During the Qualitative Phase, an interview was conducted with 50 informants who are experts, top management, and owners of the hotels and resorts. Face-to-face interviews were carried out, using an initial set of 75 questions, which underwent validation by both internal and external validators. Following this validation process, the number of questions was refined and reduced to 50. The

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validated survey instrument was then submitted to the University of Mindanao Ethics Review Committee (UMERC) for ethical approval before proceeding to the next phase.

The inclusion criteria for the qualitative phase are employees aged 21 to 60 who work in different hotels and resorts in Region XI. The researcher will obtain informed consent from respondents, detailing the study's purpose, procedures, potential risks and benefits, confidentiality measures, and the voluntary nature of participation. Exclusion criteria are individuals not employed in Region XI hotels and resorts, those under 21 or over 60, and those unwilling to participate. Additionally, participants can withdraw without obligations or benefits at any stage, especially if privacy or confidentiality is breached, and measures will be in place to mitigate any distress or cognitive risks. Subsequent to the development of the instrument from the interview, a total of 300 hotel and resort employees from the hotel industry in Digos and Davao City participated in the survey. The gathered data was subsequently submitted to a statistician using the exploratory factor analysis (EFA). After the exploratory factor analysis EFA, another approach, the Confirmatory Factor Analysis (CFA), was applied to further validate the identified constructs. This phase involved another set of 300 respondents from Samal, Panabo, Pantukan, and Tagum City hotel and resort employees. The statistician again analyzed the results from this stage to ensure the reliability and validity of the framework before its finalization.

Following the creation and validation of the framework, the quantitative phase entails the selection of three hundred hotel and resort personnel from Region XI via stratified random sampling to guarantee that all provinces are adequately represented. The objective of this phase is to evaluate the efficacy of the proposed framework in decreasing the business's ecological footprint and to give insights that can be put into action for the development of sustainable tourist regulations.

Nguyen et al. (2019) state that stratified random sampling is a strategy that is generally acknowledged for the purpose of assuring appropriate representation of subgroups within a population under study. Including a wide range of viewpoints throughout Region XI is one way this methodology improves the generalizability and reliability of the research results.

The inclusion criteria for the quantitative phase include workers aged 21 to 60 employed at various hotels and resorts in Region XI. The researcher will get informed permission from participants, outlining the study's objectives, methodologies, possible risks and advantages, confidentiality protocols, and the voluntary aspect of participation.

The exclusion criteria include persons not working in hotels and resorts within Region XI, those under 21 or over 60, and those reluctant to engage. Furthermore, participants may leave without incurring duties or rewards, particularly in the event of violating privacy or confidentiality, and precautions will be used to alleviate any anguish or cognitive hazards.

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Materials and Instruments

Open-ended interviews and a closed-ended structured questionnaire are the main instruments used in this mixed-method study.

In-depth Interviews (IDIs) will be used in the study's qualitative phase to collect detailed, contextual information on how Green Practices are implemented in hotels and resorts. A semi-structured interview guide will maintain uniformity between interviews and provide flexibility to examine new topics and individual experiences. This method works well for revealing more profound meanings, motives, and perspectives that quantitative surveys could miss (Kallio et al., 2016).

Using purposeful sampling, key informants with significant knowledge of or direct engagement in green efforts, such as hotel managers, sustainability officers, department heads, and hotel owners, will be chosen. Depending on accessibility and availability, each interview will be performed in person or online and take thirty to forty-five minutes.

The interview guide will include open-ended questions that align with the research goals. These questions will center on perceived results of green practices, staff engagement, implementation issues, and sustainability plans. Probing approaches will extract in-depth answers and make complex concepts more understandable (Rubin & Rubin, 2012).

Exploratory Factor Analysis (EFA) was conducted with 50 respondents: experts, top management, and owners of hotels and resorts in Region XI. Face-to-face interviews were carried out using an initial set of 75 questions, which were validated by internal and external validators. Following this validation process, the number of questions was refined and reduced to 50. The validated survey instrument was then submitted to the University of Mindanao Ethics Review Committee (UMERC) for ethical approval before proceeding to the next phase.

To enhance replicability and transparency of the study, specific examples of the interview questions used during the EFA phase are provided. Under Perceptions, participants were asked: "What are the perceptions of employees within the hospitality sector regarding sustainable green practices in the hospitality industry?"How would you describe green practices in your company?" "What policies, practices, or processes constitute green practices?" "What do you think are the factors that contribute to effective and efficient sustainable green practices?" For the Environmental Policies and Regulations theme, the question was: "What existing environmental policies and regulations are related to the hospitality industry?" Under Adoption of Green Practices by Hotels, respondents answered: "How would you describe the extent to which hotels in Region XI have adopted green practices, including energy-efficient technologies, waste management systems, and water conservation measures?" Finally, a key question for Employee and Community Engagement and Awareness was: "To what extent do you believe local communities in Region XI are engaged in sustainable tourism practices?"

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In the qualitative phase, selected respondents underwent In-Depth Interviews (IDIs) using a semi-structured interview guide. This approach allowed for detailed exploration of participants' perspectives and assessments of stakeholder engagement and collaboration across diverse entities, including business owners, hotel employees, local communities, and non-governmental organizations (NGOs). The goal was to gauge the level of participation in implementing and promoting the "Green Hospitality Framework." Furthermore, the research examined the social impacts of sustainable tourism practices on local communities, considering factors such as employment opportunities, cultural preservation, and community development.

All interviews will be audio-recorded with the participants' informed consent and later transcribed verbatim for analysis. To ensure confidentiality, pseudonyms will be used and identifying information will be removed from transcripts. The data will be analyzed using thematic analysis, following Braun and Clarke's (2006) six-phase framework, to identify patterns and generate meaningful themes that support or contrast the quantitative findings. This qualitative process aims to complement the quantitative data by providing depth and nuance, ultimately contributing to a more holistic understanding of green hospitality practices in Region XI.

The study's second phase is the quantitative phase, consisting of a structured questionnaire for confirmatory factor analysis (CFA). The tool was developed for EFA using significant statements from the qualitative phase. Psychometric validity and reliability measures were established, and panel experts validated the questionnaire with an average rating of 4.6, indicating highly reliable items. The reliability test yielded a Cronbach's alpha of 0.807, surpassing the 0.70 threshold recommended by Hair, Black, Babin, Anderson, and Tatham (1998) for a reliable instrument.

Additionally, a five-point Likert scale was employed to gauge responses, ranging from "Highly Essential/Important" to "Not Essential/Important." Scores were interpreted as follows: a score of 5 (mean range 4.20 to 5.00) indicated "highly essential/important," described as very high; a score of 4 (mean range 3.40 to 4.19) indicated "essential/important," also described as very high; a score of 3 (mean range 2.60 to 3.39) indicated "somewhat essential/important," interpreted as less important/essential; and a score of 1 (mean range 1.00 to 1.79) indicated "not essential/important," interpreted as very low.

A refined version of the EFA-structured questionnaire was then used for CFA, comprising 50 items representing the four explored dimensions of green practices in the hotel and restaurant employees. Before deploying this tool, another round of reliability testing was conducted, again using Cronbach's alpha. The reliability index ranged from 0.729 to 0.926, exceeding the standards set by Hair et al. Consequently, the dimensions of employee outcomes were identified and confirmed, supported by a literature review and in-depth interviews.

Design and procedure

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This research employed a mixed methods approach, specifically following an exploratory sequential design involving an initial qualitative phase followed by a quantitative phase. The study began with comprehensive desk research, reviewing relevant theories and existing literature on green practices to identify key themes and gaps. The initial framework and research plan were submitted to the research adviser and Dissertation Advisory Committee for evaluation, revision, and approval. Once approved, request letters and informed consent forms were distributed to a purposively selected 50 participants for in-depth interviews. A structured interview guide was used to ensure consistency in data collection. In order to further refine and validate the findings, the qualitative data were subjected to a theme analysis, after which they were transformed into numerical categories and verified by specialists.

The researcher used Exploratory Factor Analysis (EFA) in the next quantitative step to look at the data's underlying structure and organize related items into logical constructs. This approach made finding patterns and connections between variables possible without depending on a preset framework. To increase internal consistency and clarity, items that did not significantly contribute to the factor structure were changed or eliminated. The outcome of the qualitative phase was a streamlined collection of criteria that reflected the fundamental aspects of green activities.

The study continued with Confirmatory Factor Analysis (CFA) to validate the proposed factor structure, following Exploratory Factor Analysis (EFA). CFA was implemented to evaluate the extent to which the identified items corresponded to the anticipated theoretical model established based on prior discoveries. This procedure entailed the assessment of the model's fit and the verification of the reliability and validity of each construct. The study's findings were further strengthened and their credibility was increased by integrating qualitative exploration and quantitative validation, which guaranteed that the final measurement instrument was conceptually grounded and statistically sound.

Exploratory Factor Analysis (EFA) was the method the researcher used to analyze data during the qualitative phase. While the Kaiser-Meyer-Olkin (KMO) index was used to evaluate the appropriateness of the sampling, Bartlett's test of sphericity was utilized to examine the factorability of the data. Principal component analysis was used to assess the constructs' dimensionality and reliability. Components with eigenvalues of at least 1.0 were chosen for the study. Based on the suggestions made by previous research (Taherdoost, Sahubuddin, and Jelaliyoon, 2004; Yong and Pearce, 2013), factor loadings lower than +0.40 were suppressed. The VARIMAX (orthogonal) rotation was applied with a default of 25 iterations.

Cattell's scree plot was used to provide a graphical representation of the number of components, and the latent root criterion was utilized to ascertain the number of dimensions. Through this study, significant elements that characterize the adoption of environmentally friendly practices were found. These characteristics include the

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perspective and behavior of management and workers, environmental rules and regulations, and employee and community participation and awareness.

The Green Practices dimension was also established, with items categorized based on their nature within a unified structure.

A CFA was conducted to determine the most suitable model of employee outcomes for restaurant employees. Six fit indicators were chosen in order to assess the appropriateness of the model: (1) For a decent model fit, the chi-square over degrees of freedom (CMIN/df) should not be more than 3.0 (Wuensch, 2008). (2) The model should explain variance with a Goodness of Fit Index (GFI) greater than 0.95. (3) Additionally, it should be above 0.95 for the Tucker-Lewis Index (TLI), which shows progress over a baseline model (Bentler & Bonett, 1980). (4) The tested and independent models' relative non-centrality should be evaluated by the Comparative Fit Index (CFI), which should be more than 0.90. (5) When used with CFI, the Root Mean Square Error of Approximation (RMSEA) should be less than 0.05. (6) A close model fit is indicated by values over 0.05 in the P of Close Fit (PCLOSE), a statistical test for RMSEA (Hu & Bentler, 1999). According to Kenny, Kaniskan, and McCoach (2015), a well-fitting model is confirmed by a p-value greater than 0.05.

Based on these criteria, multiple model configurations were analyzed. Model four was ultimately selected as the best-fit model since it met all required conditions. The research process and model development are illustrated in Figure 2.

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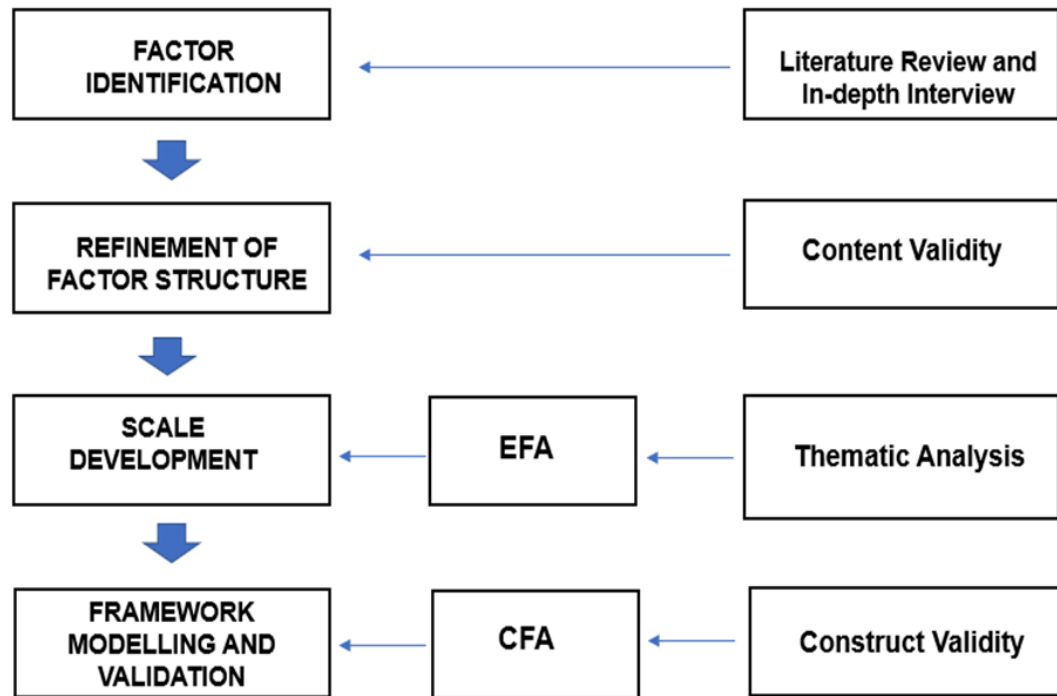[*]Corresponding Email: m.paraba.525769@umindanao.edu.ph

Figure 2: The Scale Development and Validation Process

The study strongly emphasizes ethical considerations, ensuring the responsible treatment of data by obtaining informed consent from participants and respecting the privacy of individuals and businesses involved. Additionally, the researcher ensured that all fundamental ethical principles were strictly observed and followed throughout the study. Before distributing the questionnaire to the selected hotels and restaurants in Region XI, the University of Mindanao Ethics Review Committee (UMERC) thoroughly reviewed and approved the data collection instrument. The researcher adhered to the study protocol's assessments and standardized criteria, particularly in handling the study population and managing data, as the research involved human participants. The study was approved under protocol number UMERC 2022-0416, as indicated in the Certificate of Approval (Appendix G) issued by UMERC.

RESULTS AND DISCUSSION

This chapter comprehensively presents the results and analysis based on the data and responses collected from research participants. The findings focus on:(a) Identifying the underlying dimensions that define green practices in hotels and resorts within Region

XI. (b) Conducting a confirmatory factor analysis to validate green practices of the hospitality industry.

Dimensions of Green Practices in Hotels and Resorts in Region XI

Several statistical tests were employed to determine factors of green practices of the hospitality industry, including the Kaiser-Meyer-Olkin (KMO) measure, Bartlett's test, latent root criteria, Cattell's scree plot, and principal component analysis using the rotated component matrix.

Kaiser-Meyer-Olkin (KMO) Index of Sampling Adequacy

The KMO index assesses the adequacy of the sample size for factor analysis. It serves as a measure to compare and evaluate observed and partial correlation coefficients, determining whether the data are likely to merge into meaningful components. This index ranges from 0 to 1, with a minimum recommended value of 0.6 for reliable factor analysis. However, values closer to 1 are preferable as they indicate stronger sampling adequacy.

The KMO test result in Table 1 is 0.963, substantially above the minimal criterion of 0.6. This indicates that the sample size is adequate and suitable for factor analysis (Kaiser & Rice, 1974), guaranteeing a comprehensive representation of the population under investigation. A high KMO score indicates that the data is appropriate for Exploratory Factor Analysis (EFA), facilitating the categorization of variables into separate underlying components. These results validate the dataset's suitability for further factor analysis.

Table 1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.97
Bartlett's Test of Sphericity	Approx. Chi-Square	15009.65
	df	1225
	Sig.	0

The results of the assessment to determine the adequacy and appropriateness of the sample for exploratory factor analysis (EFA) are presented in Table 1. A robust value of 0.97 was obtained using the Kaiser-Meyer-Olkin (KMO) measure, which is used to evaluate sampling adequacy. The data's high suitability for EFA is confirmed by this figure, which transcends the widely recognized threshold of 0.5. The dataset's capacity to identify distinct factors is indicated by its high KMO value, per Kaiser's (1974) standards.

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Additionally, Bartlett's sphericity test was implemented to determine whether the correlation matrix (R-matrix) differs substantially from an identity matrix.

The statistical significance (p<0.01) shown by this investigation indicates that the variables in the dataset are interconnected and have patterned connections. This bolsters the understanding that the dataset harbors meaningful interrelationships among variables, rendering it amenable to factor analysis.

Table 2. Factor Structure of Green Practices

Item Statement	1	2	3	4
4. The company encourages employees to actively participate in promoting green practices, such as implementing recycling programs and using energy-efficient equipment in the workplace.	0.776			
5. The company provides training, education, and communication about green practices to increase employee understanding and engagement.	0.764			
7. The company supports employees who value environmental sustainability as essential to the company's values and reputation.	0.758			
9. The hotel/resort management secures a proper development plan, including testing and results analysis for green practices.	0.71			
6. The company ensures employees feel secure about their workload & job stability when implementing green measures.	0.704			
3. The hotel establishment monitors the implementation of its green environmental institutional policies and programs.	0.701			
11. The company plans to fully realize the incorporation of green practices into its business operations.	0.694			
8. The management adopts pilot programs for hotels/resorts to help test the feasibility and effectiveness of green practices before broader implementation.	0.693			
13. The hotel/resort facilitates the adaptation process of Green Practices within your establishment.	0.677			
10. Green practices are discussed in your company.	0.672			
1. Employees understand sustainable environmental green practices within the hospitality sector.	0.656			

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14. The company gradually integrates basic green practices, despite budget constraints.	0.649		
2. The company ensures proper waste disposal and recycling through its institutional policies and procedures.	0.603		
15. The establishment participates in demonstrating adherence to sustainability green practices standards.	0.593		
12. The hotel or resort ensures compliance with local government regulations regarding environmental laws.	0.591		
32. The management ensures monitoring the environmental performance of green practices at its hotel/resort.	0.578		
33. The hotel/resort checks how well green practices are working through impact assessments.	0.558		
46. The hotel/resort management engages with local communities to support environmental conservation and social green initiatives.	0.489		
43. The management is committed to reducing waste and implementing recycling programs.	0.486		
49. Employees believe that educational programs and workshops organized by community-based organizations and businesses are vital to raising awareness about sustainable hospitality and tourism practices.		0.667	
48. Collaboration among government agencies, NGOs, the private sector, and local communities is essential for promoting sustainable tourism.		0.633	
17. The hotel/resort has a plan to promote energy savings, such as turning off lights and electronics when they are not in use.		0.611	
28. The hotel/resort integrates sustainable design principles into construction and renovation projects to enhance energy efficiency and comfort.		0.567	
47. Government policies and planning frameworks promote sustainable tourism practices at the local level in Region XI.		0.567	
29. Employees participate in promoting cultural heritage preservation and responsible tourism practices that respect local customs and natural resources.		0.546	
23. The hotel/resort manages recycling programs for paper, plastic, glass, and metal waste.		0.546	
18. Employees accept change within organizations and the adoption of green practices.		0.542	

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45. Our establishment adopts green practices to ensure business continuity for future generations.	0.536		
42. Our organization takes care to ensure compliance with Environmental Compliance Certificates (ECCs) and Environmental Impact Assessments (EIAs).	0.53		
30. The company ensures the participation and commitment of management, stakeholders, and employees in its green initiatives.	0.515		
50. The hotel/resort management incentivizes guests to participate in sustainability programs and adopt greener behaviors during their stay.	0.502		
34. The hotel/resort adheres to Republic Act No. 9003, the Ecological Solid Waste Management Program, to make the hospitality industry more sustainable.	0.486		
16. The hotel/resort implements energy-efficient lighting systems and motion sensors to reduce energy consumption.	0.475		
25. The hotels/resort encourages guests to use public transit and other sustainable transportation options, such as renting bicycles		0.778	
26. The hotel/resort prioritizes products with minimal environmental impact, such as certified sustainable wood and non-toxic cleaning supplies.		0.744	
20. Management encourages guests to reuse towels and linens as part of water-saving efforts.		0.693	
22. The company minimizes waste by employing single-use items and reducing packaging.		0.645	
21. The management employs water-efficient landscaping techniques and irrigation systems to reduce outdoor water consumption.		0.644	
19. The hotel/resort takes measures to minimize water usage, such as installing low-flow faucets and toilets.		0.59	
27. The hotel/resort selects suppliers that adhere to sustainable green practices and ethical labor standards.		0.574	
31. The management provides training and involves employees in sustainability initiatives to support sustainability objectives.		0.515	
35. The hotel/resort installs solar energy-efficient lighting systems, which benefits hotels in terms of energy efficiency.		0.515	
24. The management composts organic waste and food scraps to promote soil health and reduce landfill usage.		0.484	

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39. Clear policies and regulations, accompanied by incentives such as tax breaks or penalties, aid hotel/resort businesses to embrace green practices and establish a framework.				0.769
40. The hotel/resort ensures compliance with Philippine Environmental Laws and other related laws and statutes.				0.748
36. The hotel/resort strategies can be employed to encourage study and creativity in eco-friendly travel strategies.				0.707
37. The hotel/resort has a concrete and stable framework for environmental green practices.				0.627
38. The hotel/resort establishes a stable framework that allows for environmental sustainability.				0.612
41. Hotels use environmentally friendly cleaning supplies to contribute to reducing chemical pollution.				0.56
44. The hotel/resort is committed to engaging with local communities for support of green and environmentally sustainable programs.				0.479

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 7 iterations.

Table 3.1 Factor 1: Adoption of Green Practices

Item Statements	r-value
4. The company encourages employees to actively participate in promoting green practices, such as implementing recycling programs and using energy-efficient equipment in the workplace.	0.776
5. The company provides training, education, and communication about green practices to increase employee understanding and engagement.	0.764
7. The company supports employees who value environmental sustainability as essential to the company's values and reputation.	0.758
9. The hotel/resort management secures a proper development plan, including testing and results analysis for green practices.	0.71
6. The company makes sure employees feel secure about their workload & job stability when implementing green measures.	0.704
3. The hotel establishment monitors the implementation of its green environmental institutional policies and programs.	0.701

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11. The company plans to fully realize the incorporation of green practices into its business operations.	0.694
8. The management adopts pilot programs for hotels/resorts to help test the feasibility and effectiveness of green practices before broader implementation.	0.693
13. The hotel/resort facilitates the adaptation process of Green Practices within your establishment.	0.677
10. Green practices are discussed in your company.	0.672
1. Employees understand sustainable environmental green practices within the hospitality sector.	0.656
14. The company gradually integrates basic green practices, despite budget constraints.	0.649
2. The company ensures proper waste disposal and recycling through its institutional policies and procedures.	0.603
15. The establishment participates in demonstrating adherence to sustainability green practices standards.	0.593
12. The hotel or resort ensures compliance with local government regulations regarding environmental laws.	0.591
32. The management ensures monitoring the environmental performance of green practices at its hotel/resort.	0.578
33. The hotel/resort checks how well green practices are working through impact assessments.	0.558
46. The hotel/resort management engages with local communities to support environmental conservation and social green initiatives.	0.489
43. The management is committed to waste reduction and to implement recycling programs.	0.486

Employee engagement and awareness are foundational to advancing sustainability within the hospitality sector. High correlation values for green initiatives such as recycling and energy efficiency ($r = 0.776$) and employee training ($r = 0.764$) highlight the importance of fostering a well-informed and environmentally responsible workforce. These efforts not only contribute to sustainable operations but also strengthen organizational culture by supporting employees who align with environmental values ($r = 0.758$), which aligns with Zameer 2021), who emphasizes that employee-driven green innovation is key to improving organizational sustainability performance.

Strategic management actions also play a vital role in embedding sustainability into hospitality operations. Development planning ($r=710$) and the pilot testing of green initiatives ($r = 0.693$) reflect a methodical yet adaptive approach to environmental challenges. The findings suggest a balance between operational goals ($r = 0.7040$ and employee well-being $r = 0.701$), particularly in efforts to maintain job stability during

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green transitions, reinforcing that sustainability should not come at the cost of workforce security.

Regulatory compliance and policy enforcement remain moderate in influence (ranging from 0.558 to 0.603), indicating that while frameworks are in place, implementation and monitoring could be strengthened. Gaps in environmental performance evaluations (r = 0.578) and impact assessments (r = 0.558) suggest that institutions need more consistent tools to measure sustainability outcomes (Bohdanowicz, 2006).

However, community engagement and social responsibility appear to be the least prioritized, with the lowest ratings for initiatives involving local communities (r = 0.489) and waste reduction efforts (r = 0.486). These findings highlight a key area for development, as genuine sustainability extends beyond internal practices and must include partnerships with local stakeholders to achieve broader environmental and social impact (Graci & Dodds, 2008).

Table 3.2. Factor 2: Employees and Community Engagement and Awareness

Item Statements	r-value
49. Employees believe that educational programs and workshops organized by community-based organizations and businesses are vital to raising awareness about sustainable hospitality and tourism practices.	0.667
48. Collaboration among government agencies, NGOs, the private sector, and local communities is essential for promoting sustainable tourism.	0.633
17. The hotel/resort has a plan in place to promote energy savings, such as turning off lights and electronics when they are not in use.	0.611
28. The hotel/resort integrates sustainable design principles into construction and renovation projects to enhance energy efficiency and comfort.	0.567
47. Government policies and planning frameworks promote sustainable tourism practices at the local level in Region XI.	0.567
29. Employees participate in promoting cultural heritage preservation and responsible tourism practices that respect local customs and natural resources.	0.546
23. The hotel/resort manages recycling programs for paper, plastic, glass, and metal waste.	0.546
18. Employees accept change within organizations and the adoption of green practices.	0.542
45. Our establishment adopts green practices to ensure business continuity for future generations.	0.536

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Item Statements	r-value
42. Our organization takes care to ensure compliance with Environmental Compliance Certificates (ECCs) and Environmental Impact Assessments (EIAs).	0.53
30. The company ensures the participation and commitment of management, stakeholders, and employees in its green initiatives.	0.515
50. The hotel/resort management incentivizes guests to participate in sustainability programs and adopt greener behaviors during their stay.	0.502
34. The hotel/resort adheres to Republic Act No. 9003, the Ecological Solid Waste Management Program, to make the hospitality industry more sustainable.	0.486
16. The hotel/resort implements energy-efficient lighting systems and motion sensors to reduce energy consumption.	0.475

Employee and community engagement play a pivotal role in advancing sustainable tourism and hospitality practices. The findings suggest that initiatives such as educational programs and workshops (r = 0.667) organized by local communities and businesses significantly raise awareness and promote responsible environmental behavior within the industry. This finding supports the assertion by (Graci & Dodds, 2008) that stakeholder collaboration and continuous learning are key enablers of green hospitality.

Collaborative efforts between government agencies, NGOs, the private sector, and local communities (r = 0.633) enhance the reach and impact of sustainability initiatives. Simple but effective practices, such as energy-saving behaviors (r = 0.611) and green building design (r = 0.567), further demonstrate the practical integration of sustainability at the operational level (Zameer 2021).

While government frameworks (r = 0.567) and employee participation in cultural heritage preservation (r = 0.546) support broader sustainability goals, moderate correlation values indicate the need for stronger policy enforcement and training. Efforts in waste management (r = 0.546) and regulatory compliance (r = 0.530) show progress but also suggest room for improvement in monitoring and implementation.

The industry's success in achieving long-term sustainability hinges on shared responsibility among management, staff, and guests (r = 0.515; Statement 50, r = 0.502). While policies such as the Ecological Solid Waste Management Act (RA 9003) and energy-efficient technologies (r = 0.475) are in place, their lower correlation values highlight the need to strengthen awareness, incentives, and enforcement strategies.

Table 3.3 Factor 3: Manage and Employees' Perception and Behavior

Item Statements	r-value

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25. The hotels/resort encourages guests to use public transit and other sustainable transportation options, such as renting bicycles	0.778
26. The hotel/resort prioritizes products with minimal environmental impact, such as certified sustainable wood and non-toxic cleaning supplies.	0.744
20. Management encourages guests to reuse towels and linens as part of water-saving efforts.	0.693
22. The company minimizes its waste by employing single-use items and reducing packaging.	0.645
21. The management employs water-efficient landscaping techniques and irrigation systems to reduce outdoor water consumption.	0.644
19. The hotel/resort takes measures to minimize water usage, such as installing low-flow faucets and toilets.	0.59
27. The hotel/resort selects suppliers that adhere to sustainable green practices and ethical labor standards.	0.574
31. The management provides training and involves employees in sustainability initiatives to support sustainability objectives.	0.515
35. The hotel/resort installs solar energy-efficient lighting systems, which benefits hotels in terms of energy efficiency.	0.515
24. The management composts organic waste and food scraps to promote soil health and reduce landfill usage.	0.484

The perception and behaviors of employees and management are central to implementing sustainability in the hospitality sector. Hotels and resorts encourage guests to adopt eco-friendly habits such as using sustainable transportation (r = 0.778) and choosing low-impact products like non-toxic supplies (r = 0.744), reflecting a strong commitment to reducing environmental impact (Bohdanowicz, 2006). Water conservation practices, such as towel and linen reuse (r = 0.693) and reduced use of single-use packaging (r = 0.645), support resource efficiency and align with global sustainability efforts (Mensah, 2006).

Efforts extend to operational systems, including water-efficient fixtures and sustainable procurement choices (r = 0.574), ensuring alignment between internal policies and supply chain standards. Moderate correlations for staff training (r = 0.515) and solar lighting (r = 0.515) indicate existing initiatives, though there is room for greater integration. Composting (r = 0.484), while beneficial, remains underutilized, pointing to the need for improved waste management systems.

This briefly explained that employee and management behaviors significantly influence the success of green practices. Continued efforts in staff engagement,

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procurement ethics, and operational improvements are essential for advancing sustainability in the hospitality industry.

Table 3.4 Factor 4: Environmental Policies and Regulations

Item Statements	r-value
39. Clear policies and regulations, accompanied by incentives such as tax breaks or penalties, aid hotel/resort businesses to embrace green practices and establish a framework.	0.769
40. The hotel/resort ensures compliance with Philippine Environmental Laws and other related laws and statutes.	0.748
36. The hotel/resort strategies can be employed to encourage study and creativity in eco-friendly travel strategies.	0.707
37. The hotel/resort has a concrete and stable framework for environmental green practices.	0.627
38. The hotel/resort establishes a stable framework that allows for environmental sustainability.	0.612
41. Hotels use environmentally friendly cleaning supplies to contribute to reducing chemical pollution.	0.56
44. The hotel/resort is committed to engaging with local communities for support of green and environmentally sustainable programs.	0.479

Environmental policies and regulations are key drivers of sustainability in the hospitality sector. Clear frameworks and incentives, such as tax benefits or penalties, encourage green practices (r = 0.769), highlighting the influence of regulatory tools in promoting sustainable operations (Chan & Hawkins, 2010). Compliance with Philippine environmental laws and related statutes (r = 0.748) is well integrated into hotel management, reflecting an industry-wide commitment to legal and ethical sustainability standards.

The support for research and innovation in eco-tourism strategies (r = 0.707) shows the sector's recognition of the need for continuous development in green practices. Meanwhile, the establishment of sustainability frameworks and operational structures suggests that institutional support exists but may need reinforcement for broader and more consistent application.

The adoption of eco-friendly cleaning supplies (r = 0.560) contributes to pollution reduction, though moderate correlation values imply cost and accessibility barriers. Lastly, the relatively low engagement with local communities (r = 0.479) signals an area for growth, where partnerships could enhance the social dimension of environmental responsibility.

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In short, environmental policies form a strong foundation for sustainability. However, full implementation requires greater focus on enforcement, innovation, and collaboration with local stakeholders.

Table 4. Total Variance Explained

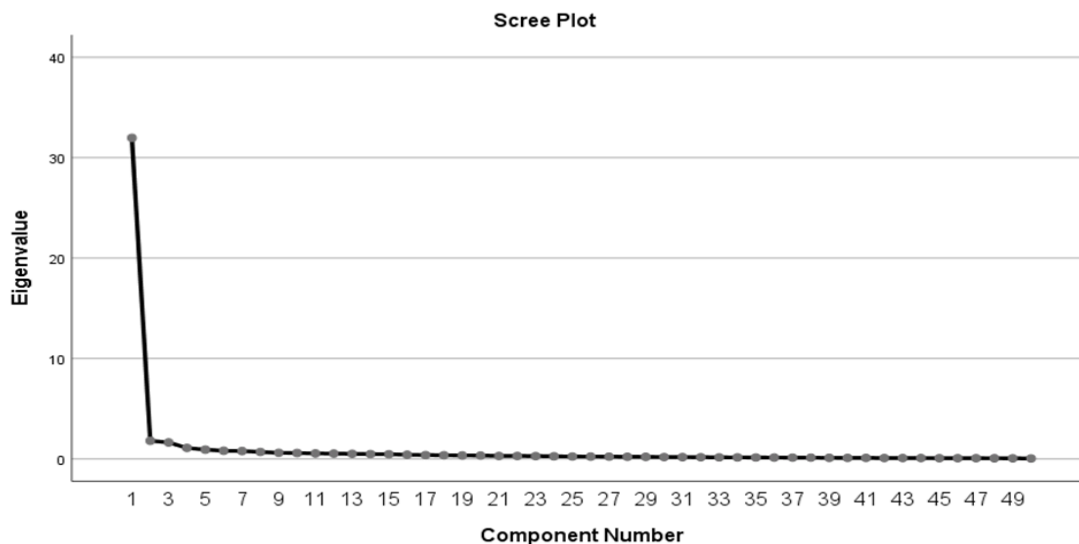| Factor	Eigenvalue	% of Variance	Cumulative %
1	31.966	63.933	63.933
2	1.809	3.617	67.55
3	1.64	3.28	70.83
4	1.097	2.194	73.024

Figure 3. Scree Plot Showing the Extracted Factors

Figure 3 depicts the scree plot derived from the secondary Exploratory Factor Analysis (EFA) undertaken within this investigation. As delineated by Cattell (1966), the scree plot employs eigenvalues extracted from either the input or condensed correlation matrix. The plot manifests as a visual representation where eigenvalues are charted on the vertical axis while factors are delineated along the horizontal axis. Through visual

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examination of the plot, analysts can identify the juncture at which there is a notable decline in eigenvalue magnitude, often termed the "elbow" of the plot.

The scree plot is valuable for discerning the number of significant factors derived from the data and the variance explicated by each factor. Specifically, analysts seek the point on the plot where the trajectory of the line connecting the plotted eigenvalues changes abruptly, indicating a marked reduction in eigenvalue magnitude. This juncture indicates the number of factors deemed meaningful for further analysis. In the context of the presented scree plot, it is evident that the instrument under scrutiny exhibits a multi-dimensional framework; the conspicuous decline in the plotted line after the fourth factor substantiates this observation. Gorsuch (1997) emphasized that the screen test's efficacy depends on specific conditions, particularly a sizable sample size and well-defined underlying factors within the data.

Validation of Dimensions of Green Practices

Following the exploratory factor analysis, the researcher identified a set of 29 items, which were then grouped into four distinct factors of green practices dimensions, such as adaptation of green practices, management and employees' perception and behavior, employees and community engagement and awareness, and environment policies and regulations. To ensure the reliability of our analysis, we systematically removed any items with factor loadings below 0.4, consistent with the rigorous criteria established by previous studies (Costello & Osborne, 2005). Additionally, the researchers eliminated any factors with fewer than three item statements (MacCallum, 1999; Raubenheimer, 2004; Fuentes and Gono, 2023; Romero and Gono Jr, 2021; Gono Jr, 2024; Gono Jr & Pacoy, 2021; Gono & Sales, 2024).

Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis, or CFA, is a crucial statistical technique for verifying the factor structure of a particular concept and ensuring that the observed variables appropriately reflect the underlying theoretical framework. Evaluating each factor's dependability before executing CFA is essential to ensure internal consistency. All indicators in this investigation showed adequate consistency, above the acceptable reliability level of 0.70 (Hair et al., 2019).

CFA is essential for statistically validating these characteristics, enhancing the robustness and generalizability of results across diverse populations. It assists researchers in verifying the alignment of the hypothesized factor structure with empirical data, hence augmenting the credibility and applicability of the theoretical framework (Byrne, 2016; Kline, 2020).

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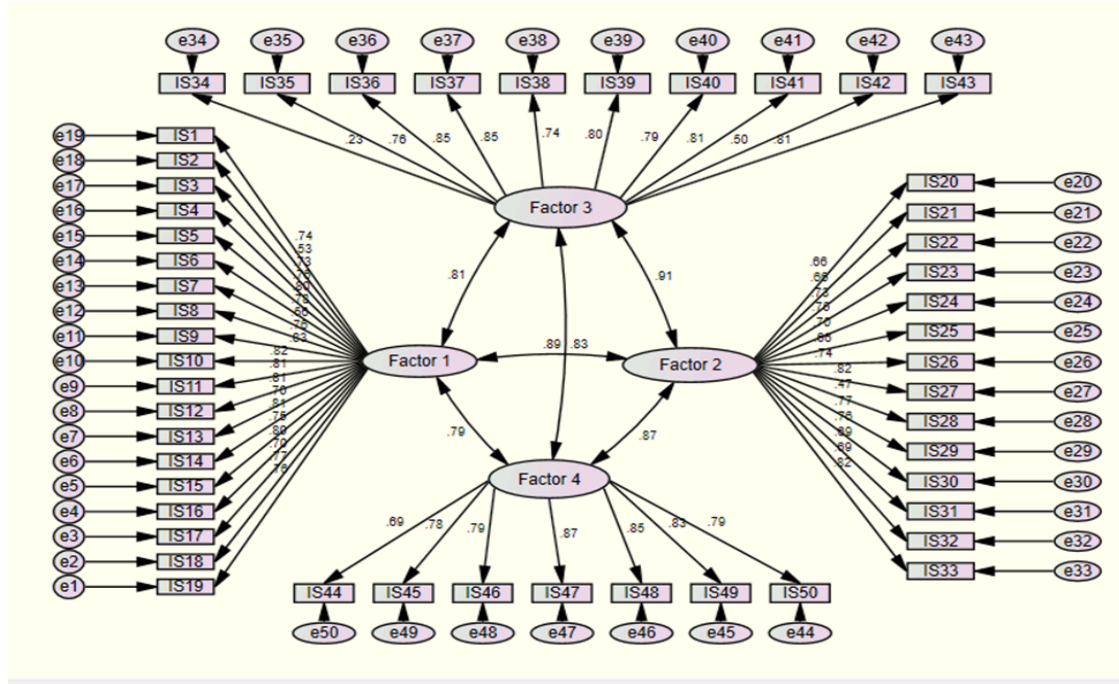[*]Corresponding Email: m.paraba.525769@umindanao.edu.ph

Figure 4. Baseline Model

A satisfactory approximation is indicated by values less than 0.08 between the observed and predicted covariances. A close fit to the population is indicated by an RMSEA value accompanied by a PCLOSE statistic of >0.05, with a good fit being supported. These metrics collectively constitute a comprehensive arsenal for researchers, which prioritizes the practical relevance and simplicity of the model, in addition to the absolute fit. The unique perspective of each index guarantees the multi-dimensional evaluation of model performance.

Table 5. Model Fit Indices

	X2	X2/df	IFI	CFI	TLI	RMSEA	PCLOSE
Baseline Model	3453.70	2.954	0.785	0.785	0.774	0.090	0.00
1. Modification 1 Deleted Items with <0.70 standardized coefficients	1547.25	2.48	0.881	0.881	0.873	0.079	0.00
2. Modification Delete Factor 2	981.67	2.43	0.91	0.91	0.898	0.078	0.000
3. Modification Correlations of error	587.59	1.67	0.962	0.962	0.953	0.053	0.283

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4. Modification Delete Item 28	534.59	1.62	0.966	0.966	0.958	0.051	0.414

The fit indices that have been discussed offer a comprehensive framework for evaluating the effectiveness of a statistical model in representing the data. The Chi-square statistic (X^2) and its ratio to degrees of freedom (X^2/df) are the primary metrics of model fit. The observed and predicted data are more closely matched when the values are lower. Nevertheless, the X^2/df ratio (acceptable if <3.00)provides a more balanced metric due to its sensitivity to sample size. Incremental indices, such as IFI and CFI, assess the extent to which the proposed model outperforms a null or baseline model. An adequate fit is indicated by values that are greater than or equal to 0.90. These indices are essential for assessing complex models, as they underscore the significance of relative development.

These are complemented by indices such as the Tucker-Lewis Index (TLI), which penalizes superfluous complexity to account for model parsimony, and the Root Mean Square Error of Approximation (RMSEA), which evaluates the residuals.

With an X2/df ratio of 2.954 and a Chi-square value of 3453.70, the baseline model exhibits a marginally satisfactory fit. However, other fit indices, such as IFI, CFI, and TLI (~0.785), fall below the threshold of 0.90, indicating a poor model fit. RMSEA is slightly above the acceptable limit at 0.090, and the PCLOSE value of 0.00 confirms the inadequacy of the fit. These results suggest the need for significant modifications to improve model adequacy.

Modification 1 (Deleted Items with <0.70 Standardized Coefficients):

This modification led to notable improvements in model fit. The Chi-square value dropped significantly to 1547.25, and RMSEA decreased to 0.079, now within acceptable limits. Fit indices (IFI, CFI, TLI) improved substantially (~0.881) but remained below the acceptable threshold of 0.90. Despite these improvements, PCLOSE remained at 0.00, indicating the model still required further refinement.

Modification 2 (Deleted Factor 2 >0.90 Coefficients):

Further refinements yielded substantial enhancements in model fit. The Chi-square value decreased to 981.67, and RMSEA improved slightly to 0.078, aligning with acceptable standards. IFI and CFI reached 0.91, while TLI neared the threshold at 0.898, indicating significant progress. However, the PCLOSE value remained at 0.00, signaling additional adjustments needed to achieve optimal fit.

Modification 3 (Correlations of Error):

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This step achieved significant improvements, with the Chi-square value dropping to 587.59 and X^2/df reducing to 1.67, indicating a much better fit. IFI, CFI (0.962), and TLI (0.953) exceeded the good fit thresholds of 0.95, demonstrating excellent fit. RMSEA improved markedly to 0.053, and PCLOSE rose to 0.283, confirming a close fit. These results signify that the model is nearing its ideal form.

Final Model

The final modification resulted in the best model fit. Chi-square reduced to 534.59, X^2/df dropped to 1.62, and RMSEA improved further to 0.051, all indicating excellent fit. IFI, CFI (0.966), and TLI (0.958) surpassed the good fit thresholds, and PCLOSE increased to 0.414, providing strong evidence of a close and robust model fit. The final model reflects the culmination of systematic adjustments to achieve an optimal representation of the data.

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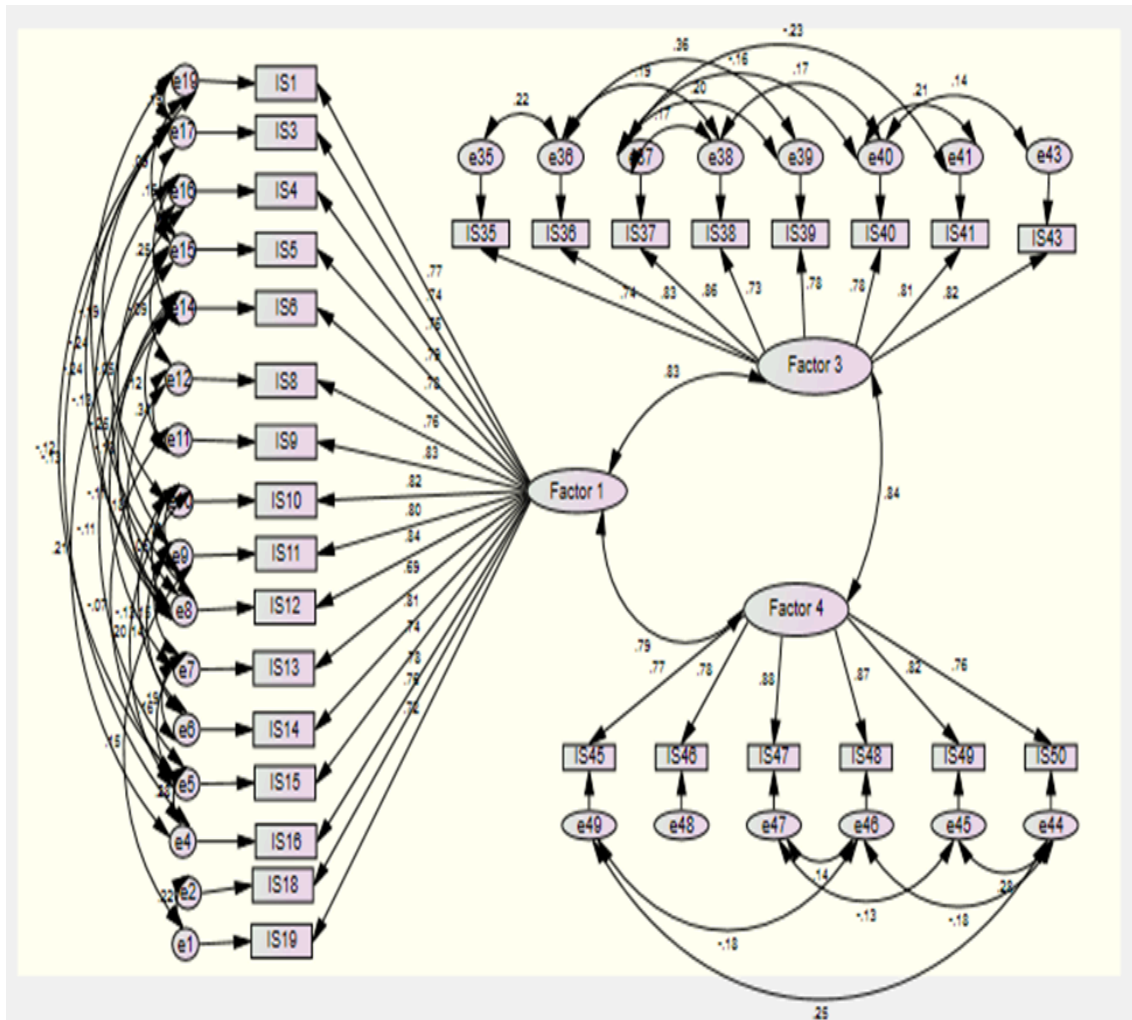[*]Corresponding Email: m.paraba.525769@umindanao.edu.ph

Figure 5-Final Model

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Table 6. Results of composite reliability and convergent discriminant validity testing

			Estimate	S.E.	C.R.	P
IS19	<---	Factor 1	1.000			
IS18	<---	Factor 1	1.102	.072	15.407	***
IS16	<---	Factor 1	1.072	.077	13.971	***
IS15	<---	Factor 1	1.036	.076	13.599	***
IS14	<---	Factor 1	1.130	.073	15.475	***
IS12	<---	Factor 1	1.288	.085	15.231	***
IS11	<---	Factor 1	1.080	.066	16.324	***
IS10	<---	Factor 1	1.178	.074	15.963	***
IS9	<---	Factor 1	1.203	.074	16.204	***
IS8	<---	Factor 1	1.209	.086	14.100	***
IS6	<---	Factor 1	1.150	.079	14.633	***
IS5	<---	Factor 1	1.153	.074	15.559	***
IS4	<---	Factor 1	1.160	.082	14.124	***
IS3	<---	Factor 1	1.056	.074	14.263	***
IS1	<---	Factor 1	1.000			
IS35	<---	Factor 3	.805	.062	12.962	***
IS36	<---	Factor 3	1.163	.076	15.272	***
IS37	<---	Factor 3	.996	.064	15.648	***
IS38	<---	Factor 3	.770	.062	12.496	***
IS39	<---	Factor 3	1.029	.075	13.735	***
IS40	<---	Factor 3	.868	.059	14.657	***
IS41	<---	Factor 3	.912	.062	14.608	***
IS43	<---	Factor 3	1.000			
IS50	<---	Factor 4	1.000			
IS49	<---	Factor 4	1.000	.065	15.320	***
IS48	<---	Factor 4	1.137	.088	12.895	***
IS47	<---	Factor 4	1.204	.087	13.899	***
IS46	<---	Factor 4	1.083	.087	12.462	***
IS45	<---	Factor 4	.940	.066	14.134	***

Estimate:

The estimate represents the standardized regression weight or factor loading, highlighting the strength of an item's relationship to its factor. Higher values indicate stronger associations, meaning the factor explains a greater proportion of variance in the

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item. For example, items in Factor 1 have loadings above 1.0, showing strong relationships to the factor and contributing to convergent validity. Similarly, loadings for Factors 3 and 4 range from moderate to strong, supporting the reliability of these factors.

The standard error reflects the variability of the estimate, with smaller values indicating higher precision. Across all factors, low S.E. values imply that the estimates are stable and reliable. This precision bolsters confidence in the regression weights and validates the significant relationships between items and their respective factors.

The critical ratio, calculated as Estimate / S.E., assesses the statistical significance of each loading. A C.R. greater than 1.96 at $p < 0.05$ confirms significance. For Factors 1, 3, and 4, all items exhibit C.R. values far exceeding this threshold, demonstrating statistically robust relationships. This aligns with the significance indicated by the p-values.

The p-value tests the statistical significance of each loading. Across all factors, "***" indicates significance at $p < 0.001$, confirming the reliability of these relationships. This high level of statistical confidence supports including the items within their respective factors.

Factor 1: Adoption of Green Practices

Factor 1 exhibits strong convergent validity, with estimates ranging from 1.000 to 1.288 and significant C.R. values. IS19 and IS1 are fixed to 1.000 to scale the factor, serving as reference indicators. These high loadings suggest that Factor 1 explains a substantial portion of the variance in its items, contributing to the robustness of the factor.

Factor 3: Management and Employee Perception and Behavior

Factor 3 demonstrates convergent validity, with significant loadings ranging from 0.770 to 1.163 and C.R. values exceeding 12.5. IS43 is fixed to 1.000 as a reference indicator. The item IS38 has the lowest loading (0.770), indicating it contributes less variance to the factor than other items, but it remains statistically significant.

Factor 4: Environmental Policies and Regulations

For Factor 4, loadings range from 0.940 to 1.204, all statistically significant with C.R. values above 12.4. IS50, fixed at 1.000, serves as the reference indicator. The strongest loading, IS47 (1.204), indicates this item makes the most substantial contribution to the factor, reinforcing its importance in explaining the variance.

The consistent statistical significance across all items in Factors 1, 3, and 4 confirms convergent validity, meaning each factor reliably measures its underlying construct. This validity ensures the robustness of the measurement model and supports its use in further analyses.

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Convergent validity is confirmed as all factor loadings are statistically significant at p < 0.001, demonstrating a strong relationship between items and their respective factors. Moreover, most loadings exceed the widely accepted threshold of 0.70, indicating that the factors effectively explain a substantial proportion of variance in their associated items. This strong explanatory power supports the reliability of the constructs and validates their representation in the model.

Discriminant validity ensures that each factor is distinct from the others in the model. The statistical significance and high loadings of items exclusively within their intended factors suggest minimal overlap between constructs. This distinction affirms that the factors measure unique aspects of the model, contributing to its overall robustness and clarity in defining separate constructs.

Table 7 Convergent/Discriminant Validity

			Estimate	S.E.	C.R.	P
Factor 4	<-->	Factor 3	.290	.037	7.869	***
Factor 4	<-->	Factor 1	.219	.028	7.792	***
Factor 1	<-->	Factor 3	.273	.033	8.292	***

Factor 4 <--> Factor 3: Environmental Policies and Regulations, Management and Employees Perception and Behavior
The correlation estimate of 0.290 indicates a weak-to-moderate positive relationship between Factor 4 and Factor 3, suggesting that while the two factors are somewhat related, they measure distinct aspects of the construct. The critical ratio (C.R.) of 7.869, statistically significant at p < 0.001, confirms the reliability of this correlation. This weak association supports discriminant validity by demonstrating that, though related, Factor 4 and Factor 3 maintain distinct identities within the model.

Factor 4 <--> Factor 1: Environmental Policies and Regulations & Adoption of Green Practices & Management and Policy   Implementation

The correlation estimate 0.219 suggests a weak positive relationship between Factor 4 and Factor 1, indicating limited overlap in the constructs they represent. The statistically significant C.R. of 7.792 (p < 0.001) reinforces the validity of this correlation. The weak relationship between these factors further supports their distinctiveness, aligning with the model's discriminant validity requirements.

Factor 1 <--> Factor 3: Adoption of Green Practices & Management and Policy Implementation

With a correlation estimate of 0.273, the relationship between Factor 1 and Factor 3 is weak to moderate, suggesting some degree of connection but also clear

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differentiation. The statistically significant C.R. of 8.292 (p < 0.001) confirms the reliability of this correlation. This weak association highlights the ability of the model to distinguish between these constructs, reinforcing discriminant validity and supporting the distinct contributions of each factor.

Convergent validity assumes that factors measuring related constructs should demonstrate moderate to strong correlations. However, in this case, while the correlations between factors are statistically significant, their weak magnitude (ranging from 0.219 to 0.290) indicates limited shared variance. This suggests that the factors are not strongly interrelated, which challenges the notion of convergent validity and instead points to the distinctiveness of the constructs.

Discriminant validity ensures that factors are not overly correlated and each represents a unique construct. The low correlation values (all below 0.30) provide robust evidence supporting discriminant validity. These results confirm that the factors are sufficiently distinct, demonstrating that the model captures unique dimensions of the broader construct without significant overlap.

CONCLUSION AND RECOMMENDATIONS

Based on the study's findings, there is a compelling need to adopt a validated green practices framework tailored to the hospitality industry in Region XI, addressing both current environmental challenges and the region's potential for sustainable tourism growth.

Final Scale on the Dimensions of Green Practices Framework in the Hospitality Industry

The final scale derived from the study highlights three essential dimensions critical to the framework's success: Adoption of Green Practices, Management and Employee Perception and Behavior, and Environmental Policies and Regulations. These dimensions serve as the cornerstone for fostering a culture of sustainability and accountability within the hospitality sector. Focusing on these key areas will significantly enhance Region XI's ability to transition toward an environmentally responsible and economically resilient tourism industry.

To strengthen the adoption of green practices, hospitality establishments are encouraged to invest in sustainable technologies that promote energy conservation, water efficiency, and responsible waste management. These may include using renewable energy sources, eco-friendly construction materials, and applying circular economy principles. Adopting such practices improves environmental performance and enhances the competitive image of Region XI as a sustainable tourism destination.

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A critical component of the framework is the engagement and behavior of management and employees. Hotel and resort owners and administrators must prioritize sustainability training, empowering staff to participate actively in green initiatives. Consistent education, capacity-building programs, and performance-based recognition can motivate employees to align their daily practices with sustainability goals. Encouraging a culture of shared responsibility both within the organization and through partnerships with local communities further amplifies the impact of these efforts. Community-based eco-tourism projects and awareness campaigns can help ensure that environmental stewardship is embedded at both organizational and societal levels.

To ensure long-term success, policymakers in Region XI play a crucial role in implementing and monitoring sustainable hospitality practices. Local government units should integrate green standards into tourism development policies and include formal sustainability training policies in their LGU programs to institutionalize environmental awareness at the local level. Additionally, training modules should be incorporated into LGU-led capacity-building programs to equip local tourism offices and hospitality businesses with the skills and knowledge needed to apply and sustain green practices effectively. Moreover, establishing a regional monitoring body or sustainability council composed of representatives from government, academe, the private sector, and civil society can help track and improve the effectiveness of these initiatives. To broaden the impact and relevance of the study, researchers are encouraged to expand the coverage beyond Region XI, adapting and validating the framework in other regions of the Philippines. These collaborative efforts, grounded in research, policy, and community involvement, can position Region XI and other participating regions as national models for responsible, inclusive, and sustainable tourism development.

Limitations and Recommendations for Future Research

While the findings provide valuable insights, the study acknowledges several limitations. First, the possibility of social desirability bias may have influenced employee responses, particularly in face-to-face interviews where respondents may have overstated their level of engagement in green practices to align with perceived expectations. Second, the model's generalizability may be limited, as data collection was focused solely on Region XI. This region's unique socio-cultural, economic, and ecological characteristics may not fully represent other areas of the Philippines or broader Southeast Asia.

While the final model demonstrated an excellent fit with a Chi-square value of 534.59, X^2/df of 1.62, RMSEA of 0.051, and fit indices such as CFI (0.966), TLI (0.958), and PCLOSE (0.414), it is acknowledged that no formal cross-validation procedure was conducted to assess the model's generalizability. This remains a limitation of the study. Cross-validation using split-sample or independent sample techniques is recommended in future research to ensure the stability and robustness of the factor structure across different data sets and contexts. This would further reinforce the model's reliability, especially when applied in varied hospitality settings or geographical regions.

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To mitigate these limitations, future research is encouraged to adopt a multi-regional approach and to employ anonymous survey administration techniques to reduce social desirability bias. In addition, longitudinal studies could help track the long-term effectiveness of green hospitality practices, while cross-validation using independent datasets could further test the robustness of the model.

Ultimately, the validated framework provides actionable and region-specific guidance to foster a more sustainable and competitive hospitality industry in Region XI. Its successful implementation has far-reaching implications in supporting the region's ecological balance and economic resilience and advancing the Philippines' commitment to global sustainability goals, particularly in the realms of responsible consumption, environmental stewardship, and climate action.

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