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Research Article

Latent Factors of Sustainable Tourism Practices and Green Hospitality Measures in Gilgit Baltistan, North Pakistan

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Abstract: The tourism activities and hospitality services are part and parcel to each other; therefore, adaptation of green management within hospitality services is inevitable for development of tourism in sustainable way. The current study therefore determines the factors responsible for development of tourism in sustainable way and green management within hospitality entities throughout Gilgit Baltistan (GB) region. Quantitative data through a structured set of questionnaires is acquired from the registered hospitality units of the study area including hotels and guest houses. Yamane's formula is used to specify the sample size from the targeted population. Following the result of applied formula, 177 hospitality managers out of 499 total registered hospitality units are approached from all the three divisions of Gilgit Baltistan. To determine the latent factors, factor analysis is applied on the data through statistical software. To ensure the appropriateness of the statistical analysis, Kaiser-Mayer-Olkin (KMO) and Bartlett's test is applied initially. KMO sampling adequacy of 0.626 and Bartlett's test of sphericity with most significant value of ($p < 0.001$) endorsed the appropriateness of the proposed analysis. Rotated Components Matrix through Kaiser Normalization concluded seven latent factors with different components of variances including six factors related to hospitality management services. Hence, green management in hospitality is necessary for sustainability in tourism.

Keywords: Factor Analysis, Green Management, Hospitality Units, Quantitative Data, Rotated Matrix.

1. INTRODUCTION

Sustainable tourism encompasses the conservation and expansion of tourism. It addresses the present requirements and needs of both tourists and the local community, with a focus on future sustainability [1]. The conception of sustainability in tourism materialized with the goal of mitigating and minimizing the discouraging effects of tourism activities [2, 3]. This also aims to ensure the satisfaction of both local and international tourists at their destinations. Moreover, itis simultaneously contributing to the improvement of host communities and their income levels. Furthermore, the protection of local traditions and cultural landscapes is considered an essential and integral aspect of sustainable tourism development [4, 5]. The initial framework for sustainable tourism approaches can be categorized through: tourists, hospitality managers, operators and the community [6, 7]. The three initial domains in which sustainable tourism approaches are elucidated are Economy, society and environment [8-10].

The reality as well as integrity of the overall process of sustainable tourism cares all the aspects of nature and anthropogenic involvement through protected travel [11]. The stakeholders' take the course of actions in such a way that the fulfillment of the criteria under the umbrella of sustainable tourism is guaranteed [12]. To make the tourism activities sustainable at the tourists' destinations, the participation of people within the proximity of a destination is given utmost importance in decision making process for the defined domains of sustainable tourism [13, 14]. Sustainability in tourism is the utmost need of the time as this industry has now become second largest industry after petroleum industry world widely [15-17].

Green Hospitality Management (GHM) is an innovative and remarkable progression in the field

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of hospitality management, specifically designed to address environmental concerns related to hotel services [18]. GHM incorporates various practices such as the utilization of renewable power possessions, substitute technologies, green services in hospitality, and the implementation of sustainable actions [19]. Additionally, GHM focuses on promoting and utilizing local brands in hospitality services, while also emphasizing the financial benefits associated with such practices [20].

Tourism activities and hospitality management are intrinsically interconnected due to the essential part of hospitality services in facilitating guests at the destinations and making their access to resorts [21, 22]. The arrangement of conveyance, lodging, and food, collectively referred to as hospitality services, is crucial for the commencement, persistence, and progress of tourism in every locality [23, 24]. Consequently, Green Hospitality Management has emerged as a recent alternative term encompassing sustainable hospitality measures. The relationship between sustainable tourism and green hospitality management is directly proportional, as sustainable tourism development cannot be achieved without implementing sustainable hospitality measures [25].

Through Green Hospitality Management, eco-friendly practices are implemented within hotels and other accommodation arrangements including; waste reduction and recycling, water and energy conservation, and mitigation of harmful emissions [26, 27]. The environmental initiatives, which are preferred by tourists, are the key components of responsible measures adopted in this management approach [28-30]. The main aim of this research is to determine the factors which are necessary to cope with tourism sustainable economically, socially and environmentally and to specify the dynamics to green hospitality management in the study area.

2. THE STUDY AREA

The previously known northern area of Pakistan and currently Gilgit Baltistan region is the study area for this research. The study area is located between 32º 10′ 0″ to 37º 20′ 0″ N latitude, 72º 40′ 0″ to 80º 50′ 0″ E longitude (Figure 1).

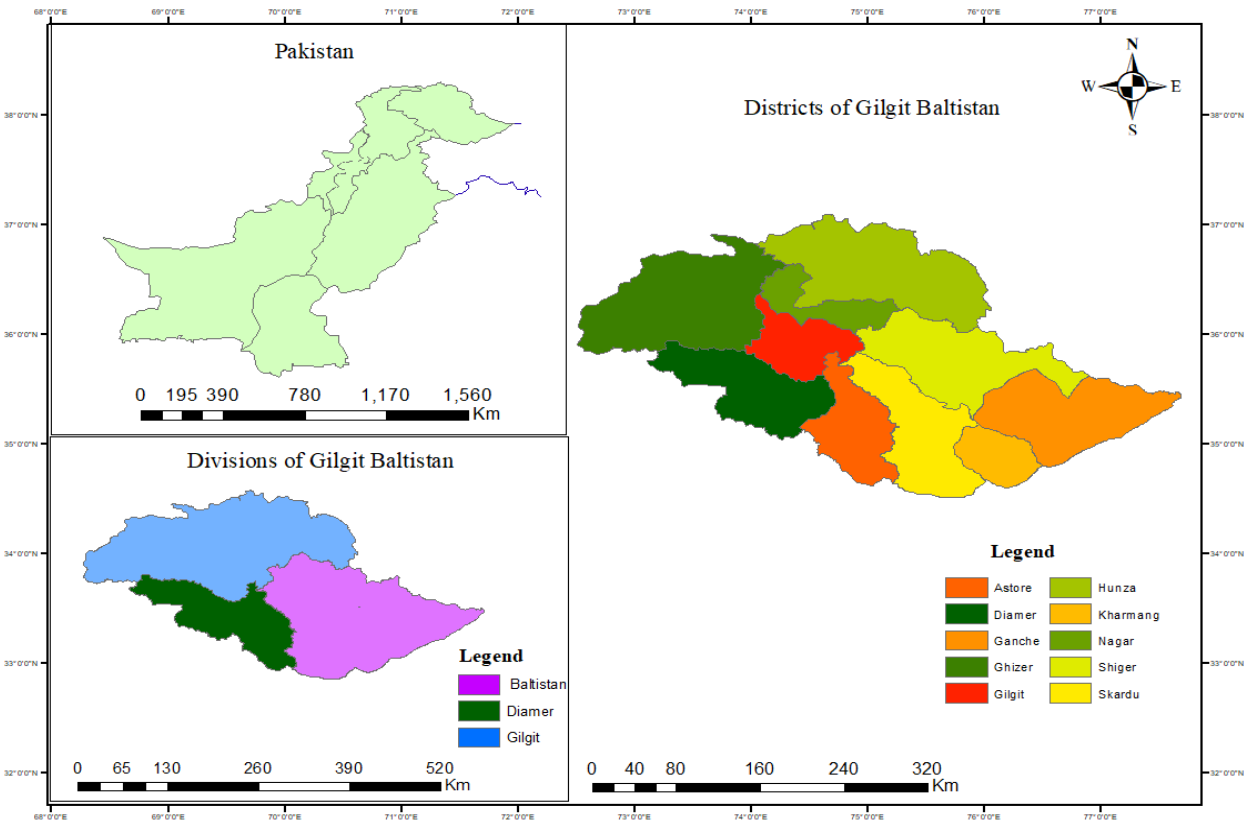

Fig.1. Location Map, Gilgit Baltistan.

3. MATERIALS AND METHODS

To determine the latent factors of sustainable measures in development of tourism and green practices in hospitality are the central theme of this research. This study is based on quantitative method of research. Primary data using a structured questionnaire is used to get the responses of targeted respondents. Among all the stakeholders of tourism and hospitality management in Gilgit Baltistan, the registered hospitality units are selected as Population. The sample size is finalized through "Yamane Formula" [31].

$$\text{Formula:} \quad n = \frac{\mathrm{N}}{1 + \mathrm{N(e)}^2}$$

Where,

n = The sample size
N = The Population size
e = The acceptable sampling error

The data acquisition from Directorate of Tourism, Gilgit Baltistan revealed that total registered hospitality units in the region are 499. The application of formula on the total registered hospitality units proposed 177 hospitality service providers as sample size. Therefore 177 hospitality managers are approached randomly to get responses on questionnaire from all the three administrative divisions of Gilgit Baltistan; Diamer, Gilgit and Baltistan division. The collected data is analyzed quantitatively through SPSS using Data Reduction method [32].

4. RESULTS AND DISCUSSION

4.1. Factor Analysis: Responses of Hospitality Managers of Gilgit Baltistan

Factor analysis is utilized to identify the influential factors in the sustainable development of tourism activities and the green services in hospitality management. The factors examined here reflect the perspectives of hospitality managers who oversee various accommodations such as hotels, guest houses, camping sites, and huts, catering to both domestic and international tourists. The data collected from these hospitality managers is obtained through a structured questionnaire featuring nominal variables. The inclusion of factors is based on the principles of "green hospitality management," allowing for an assessment of the habitual practices of hotel managers in relation to these principles. Additionally, the crucial factors for the sustainable growth of tourism practices are also determined.

To streamline the factors and address the issue of high variability, associated statistical tests are employed alongside factor analysis. These tests help consolidate the numerous factors into a smaller set based on the co-linearity within the specified variables. This co-linear amalgamation of many variables facilitates the identification of hidden or underlying factors related to sustainable tourism development (STD) and green hospitality management (GHM). By focusing on these latent factors, it becomes possible to achieve sustainability in tourism and hospitality services.

4.2. Application of KMO and Bartlett's Test for Data Suitability in Study Area

The Kaiser-Mayer-Olkin (KMO) is utilized to appraise the aptness of data reduction analysis for the given data [33]. The mentioned test examines the proportional values of variances among the given variables. The suitability statistics ranged from 0-1, with a higher value indicating greater suitability for factor analysis. A minimum value of 0.5 is generally required for reduction of values, while 0.5 to 0.8values are defined as adequate without the need for remedial action. Typical values for suitability fall within the range of 0.8 to 1.

"Bartlett's-Test" is an essential part of the KMO-test in the "Data Reduction" part of the analysis portion in the statistical software. This test is also essential for shaping the usefulness of the acquired data for "factor analysis". The significance level of the test ensures the data adequacy. Values exceeding the particular range may need corrective measures to tackle the flaws in given data before applying factor analysis.

In the case of the data collected from hospitality managers in Gilgit Baltistan, the KMO test was performed to assess its appropriateness for factor analysis. The "KMO Sampling Adequacy measure" for the existing data is accounted as 0.626, which indicates that the given data suits this analysis. Additionally, the "Bartlett's-sphericity test" yielded a highly considerable value with ($p < 0.001$) for the given variables (Table1).

Table 1. Hospitality Managers' Responses and KMO-Bartlett's Test.

Kaiser-Meyer-Olkin Sampling Adequacy Measures		0.626
Bartlett's-Sphericity Test	Chi-Square Approx.	2687.132
	Df.	300
	Significance	0.000

4.3. Sustainability in Tourism and Green Management: Scree Plot

The Scree-plot or the Scree-test is a diagrammatic demonstration of multivariate data in statistical form. It authenticates the specification of related variables that shows co-linearity base on their values (eigen) in data reduction analysis. The Scree plot also helps in determining the appropriate sets of factors to be retain. It visualized the eigen values for each factor in a descending line or curve, providing an ordering from highest to lowest characterization. In the case of the responses obtained from hotel managers focusing sustainable activities in tourism and green practices in the hotel industry, the Scree plot resulted in the retention of five factors. These factors were determined based on the eigen values associated with the 25 variables. The extracted eigen values ranges from 5.2 to 0.049 approximately (Figure 2).

4.4. Explained Total Variance

In the current section, the response of hotel managers is represented by a total of 25 variables (Table 2, variables; Table 3, Total values). The percentage of variance is computed for each of these linear components based on their eigen values. Upon analyzing the initial eigen values, it is determined that exactly seven components (1 - 7) out of the total 25 have eigen values exceeding one, while the remaining 18 variables (8-25) have below one eigen values (Table 2). The eigen value ranges; above and below one disclosed that the variables with greater than one eigen shows a higher percent of variances compared to those with eigen values below one. The eigen values for the components exceeding one range from 5.249 to 1.296, with cumulative percentages ranging from 20.996% to 72.055%. On the other hand, the eigen values below one ranges from 0.989 to 0.049. In order to reach a cumulative percentage of 100%, the cumulative percentage for eigen values below one starts with 76.011%. Additionally, the eigens and variance percentage are calculated with the squared loadings of rotated sums (Table 2).

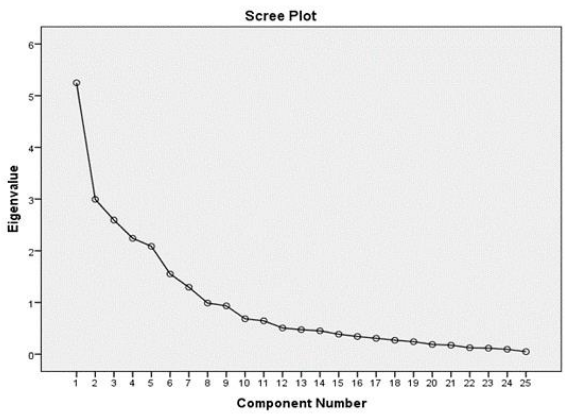

Fig.2. Hospitality Managers' Perception: Scree Plot.

4.5. Tourism Sustainability and Green Hotel Management: Factor Analysis

The perceptions of hotel managers in Gilgit Baltistan (GB) have led to the identification of seven distinct factors, each consisting of various components. Except for factor five, which has a different composition, all other factors encompass three or more components that necessitate analysis. The extraction method used is "Principal Component-Analysis," employing "Varimax with Kaiser-Normalization" during the extraction process. The objective is to find out the hidden factors related to sustainability of tourism and Green hotel management. In this approach, each and every variable within a component is measured as a factor, and a suitable comprehensive label is assigned to encompass all the variables as essential components.

4.5.1. Unsustainable consumption: Factor I

The reduced variables in this factor are; burden on hospitality services, 0.808, visit with personal vehicles, 0.759, plastic product usage, 0.754 and increase in emission of harmful substance, 0.681.

In this factor there are four linear variables that contribute to a latent factor aimed at achieving sustainable tourism activities and hospitality services. These four variables collectively focused on minimizing the discouraging impact on the natural environment. The first variable raises awareness about the increasing demand

Table 2. Explained Total Variance: Hospitality Managers' Responses.

Variables	Initial values of Eigens			Extraction-Sums: Squared Loadings			Rotation-Sums: Squared Loadings		
	Total	Percent of Variance	Cumulative Percent	Total	Percent of Variance	Cumulative Percent	Total	Percent of Variance	Cumulative Percent
1	5.249	20.996	20.996	5.249	20.996	20.996	3.624	14.498	14.498
2	2.995	11.979	32.975	2.995	11.979	32.975	2.889	11.554	26.052
3	2.594	10.377	43.352	2.594	10.377	43.352	2.725	10.900	36.952
4	2.242	8.967	52.319	2.242	8.967	52.319	2.393	9.571	46.524
5	2.087	8.346	60.665	2.087	8.346	60.665	2.261	9.044	55.567
6	1.552	6.208	66.873	1.552	6.208	66.873	2.169	8.676	64.243
7	1.296	5.182	72.055	1.296	5.182	72.055	1.953	7.812	72.055
8	0.989	3.956	76.011						
9	0.935	3.740	79.751						
10	0.685	2.741	82.492						
11	0.646	2.584	85.076						
12	0.508	2.030	87.106						
13	0.474	1.898	89.004						
14	0.452	1.808	90.812						
15	0.386	1.544	92.356						
16	0.343	1.371	93.727						
17	0.308	1.230	94.957						
18	0.270	1.081	96.038						
19	0.242	0.968	97.006						
20	0.189	0.755	97.760						
21	0.174	0.698	98.458						
22	0.125	0.499	98.958						
23	0.117	0.468	99.426						
24	0.095	0.379	99.805						
25	0.049	0.195	100.000						

Extracted Method: Principal Component Matrix.
Source: Field Survey.

for resources used in the hospitality industry to provide adequate services. The influx of tourists poses challenges to these resources, as sustainable resource management becomes essential. The use of personal vehicles by tourists contributes to an increase in private transportation within the tourism sector, leading to various environmental issues such as pollution. Another significant concern is the lack of sufficient parking facilities for the large number of vehicles, particularly in guest houses and majority of hotels (Table 3).

The excessive use of plastic products, which is known to contribute to significant environmental degradation, is a major concern in the tourism and hospitality management industry. It is imperative to reduce or eliminate the use of plastic bags as part of sustainable and eco-friendly practices. Additionally, limiting or completely eliminating harmful substances, particularly carbon emissions, is crucial in achieving sustainability objectives (Table 3).

4.5.2. Unfamiliarity with sustainable approaches: Factor II

The 2nd factor extracted the following variables; non-renewable resources usage, 0.794, waste recycling practice, 0.728, familiarity of green practices, 0.687, familiarity of sustainable tours, 0.670 and reservation on services, 0.563.

This factor specified five variables to disclose one of the significant hidden factors for tourism sustainability and Green management in the study area. All variables loaded in the given factor based from the lack of familiarity of hotel managers with sustainable practices. The usage of non-renewable resources is an important hurdle towards sustainable development of tourism. Therefore, shifting of hospitality measures focus towards renewable and eco-friendly resources. Given that waste generation is inherent in the hospitality industry, recycling measures are essential to mitigate the waste generated through tourism services. It is crucial for hospitality management to prioritize recycling initiatives within the study area (Table 3).

To address unsustainable day-to-day practices, it is essential for hospitality managers to be familiar with green practices within guest houses, hotels and other hospitality entities [34]. Tourism officials can raise awareness among hospitality managers through dedicated sessions on this subject. Since hospitality managers cater to both the local and non-local tourists for lodging, awareness with sustainable tourism is of key importance. Tourists generally expect the provision of top-quality services based on the capacity and capability of hospitality establishments. When the standard of services is compromised, tourists' express reservations. Green management practices evaluate the quality of services based on environmental measures (Table 3).

4.5.3. Monitoring the hotel services: Factor III

Variables extracted in 3rd factor according to "Principal-Component-Analysis" are; organic foods availability, -0.807, food wastage -0.760, Natural environment disturbed, 0.667 and deviation of local culture, 0.613.

In order to determine the third hidden aspect of sustainable practices in tourism and environmentally-friendly practices in the hospitality sector, the survey data from hospitality managers in the area were examined for four interrelated factors. These factors encompass various aspects of monitoring sustainability within hospitality services. The initial two factors within this aspect encompass the fundamental components of environmentally-conscious management in the hospitality field. Giving prominence to offering organic food to visitors and minimizing or eradicating food waste hold significance in the context of green hospitality management (Table 3).

Undoubtedly, hospitality services have influence over the natural landscape [35]. The fundamental objective of implementing green management practices in hospitality is to minimize negative impacts and maximize encouraging impacts to the nature. To preserve the cultural heritage of the region, particular attention is given to upholding local customs and traditions (Table 3).

4.5.4. Eco–consciousness within hospitality entities: Factor IV

The variables included in 4th factor are; suggestions to tourists, -0.797, disposal of wastes, -0.751 and drinking water wastage, 0.622.

Latent factor IV consists of three variables that exhibit linear coherence and are integral to green practices in the region. The given variables have direct association with the environmental awareness of hotel managers. Environmentally familiar managers suggest tourists to prefer sustainable practices within the hospitality units and during the entire tour. Demonstrating this consciousness, these managers ensure proper waste disposal arrangements within the hospitality units. Additionally, they actively discourage the wastage of drinking water among both staff and tourists (Table 3).

4.5.5. Tourists' responsible behavior during the tour: Factor V

The extracted variables in 5th factor are local products usage, 0.751 and security/safety issues, -0.655.

Factor V carries only 02 variables, which is concerned with the responsible practices of the tourists towards sustainable practices during their tours in the study region. This specified factor shows the responsibilities of visitors in promotion of sustainable actions. Responsible tourists prioritize and appreciate local products during their accommodations at the destination. By favoring local brands and products, they contribute to the economic advancement and empowerment of the hosting people. The enhancing interests of tourists

in local products stimulate the participation of locals in economic activities. Furthermore, responsible tourists refrain from engaging in behaviors that compromise safety or security, demonstrating their responsible conduct [36]. Both variables are crucial for the social as well as economic sustainability of tourism practices in the region (Table 3).

4.5.6.Sustainable practices and perceptions of hospitality managers: Factor VI

The extracted variables along 6th factor are; solid waste accumulation, 0.740, energy saving products, 0.697, reduction in non-renewable, 0.645 and inorganic foods and materials, 0.565.

Factor VI revealed four variables derived from the feedback of sustainability-conscious hospitality managers in the tourism and GHM sector. These variables encompass the sustainable practices that should be implemented by hotel and accommodation staff as part of their sustainability initiatives. Local hospitality managers are well aware that solid waste accumulation becomes

Table 3. Perceptions of Hospitality Managers: Rotated Matrix.

	Components						
	01	**02**	**03**	**04**	**05**	**06**	**07**
Burden on hospitality services	0.808	-0.160	0.155		0.151	0.269	
Arrival of tourists with private vehicle	0.759		-0.200	-0.121			0.171
Needless usage of plastic products	0.754	-0.104			0.189	0.172	
Increase in harmful-emissions	0.681	-0.135	0.178		-0.145		-0.203
Non-renewable resources		0.794	-0.413				
Waste recycling	-0.305	0.728		-0.233			0.105
Awareness about Green management	-0.142	0.687	0.344	0.428	-0.163	-0.187	
Familiar with Sustainability in tourism	-0.114	0.670		0.582	-0.153	-0.161	-0.133
Reservations regarding services	-0.293	0.563	0.240	0.166	0.303	-0.266	
Offering organic food	-0.179		-0.807		0.168		
Food wastage in hotels	0.154	0.267	-0.760	0.285			
Natural environment disturbance	0.305	0.209	0.667		0.383		0.190
Deviation to local customs		0.181	0.613	0.151	-0.508		-0.215
Sustainable tour suggestions to the tourists	0.207	0.131	0.167	-0.797		-0.110	0.264
Disposal the wastes		-0.149		-0.751	0.205		-0.272
Drinking water wastage	-0.176		-0.118	0.622	0.553		-0.361
Use of local products	0.258				0.751		-0.173
Security or safety issues					-0.655		
Accumulation of solid waste	0.262	-0.157			-0.215	0.740	0.126
Energy saving practices	-0.201			-0.191		0.697	-0.354
Reduction in resource usage	0.479	-0.144				0.645	0.153
Inorganic food in hotels	0.532	-0.118			0.377	0.565	
local food availability		0.196		-0.126			0.819
Water conservation	0.370	-0.331	-0.356			0.293	0.565
Allergen features	-0.291	-0.152	0.178		-0.231		0.542

Source: Field Survey.

prevalent during the tourism season, presenting a direct challenge to sustainability in tourism and hospitality establishments. To tackle this issue, alternative sources and proper waste disposal methods can be employed. Apart from waste management, hospitality managers also need to prioritize the conservation of energy resources within hotels, restaurants, and guest houses. This objective can be accomplished by utilizing energy-efficient appliances and minimizing excessive energy consumption (Table 3). Undoubtedly, resources are essential for providing proper services in hotel management. However, to ensure resource sustainability, managers can reduce their usage by identifying and minimizing needless areas [37]. The usage of inorganic foods for serving tourists in hospitality services is also evaluated in terms of green management. In this regard, hospitality managers can substitute inorganic materials with local and organic products (Table 3).

4.5.7 Green management within hospitality units: Factor VII

The 7th factor extracted the given variables; offering local food 0.819, conservation of water, 0.565 and allergen issues in hotels, 0.542.

Factor VII loaded three variables associated with the green management practices that should be prioritized in hospitality services in the GB region. One aspect of green management is the offering of local foods, which not only adds uniqueness and distinction to the hospitality service but also promotes endemic brands and preserves the customs of the region. Regional foods provide benefits to both the locals and the food seekers. Another initiative of green management in hospitality services focuses the reduction of water wastage, regardless of its abundance. It is crucial to prevent water wastage in the hosting units. Additionally, green practices prioritize the health concerns of tourists [38] with the availability of non-allergic features within guest houses and other hospitality centers [39] including the hotels (Table 3).

5. CONCLUSIONS

Reduction of factor was applied using SPSS to specify the hidden factors contributing towards tourism sustainability and green practices in the hospitality entities based on sustainable measures. The data for this analysis was collected through questionnaires administered during a field survey, and all relevant tests associated with the analysis were conducted. The adequacy of the data collected from hospitality managers was assessed using the "KMO-Measures for Sampling-adequacy," which carried the value having 0.626, indicating sufficient data for factor analysis. Additionally, the "Bartlett's-sphericity test" showed a greatly significant statistics of ($p < 0.001$). The scree plot revealed five factors from the 25 components, as indicated by the eigen numbers. Furthermore, the total variance showed the interdependent factors based on the eigens, identifying seven out of the 25 components. These seven latent factors include unsustainable consumption, lack of familiarity with sustainable measures, monitoring the services of hotels, environment-consciousness of hospitality managers, tourists' friendly behavior, sustainable practices carried out by hotel managers, and green measures within hospitality entities. The integration of sustainability in tourism activities and the implementation of green hospitality management are crucial for the advancement of sustainable tourism development.

6. CONFLICT OF INTEREST

The authors declare no conflict of interest.

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