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Why Is Green Hotel Certification Unpopular in Taiwan? An Analytic Hierarchy Process (AHP) Approach

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Abstract: The main purpose of this study was to investigate the factors that discouraged Taiwan hoteliers from applying for green hotel certification. The analytic hierarchy process (AHP) method was used to perform a weighted analysis that comprehensively identified important hindering factors based on information from hotel industry, government, academic, and consumer representatives. Overall, in order of importance, the five dimensions of hindering factors identified by these experts and scholars were hotel internal environment, consumers' environmental protection awareness, environmental protection incentive policy, hotel laws and regulations policy, and hotel external environment. Among the 26 examined hindering factor indices, the three highest-weighted indices overall for hoteliers applying for green hotel certification were as follows: environmental protection is not the main consideration of consumers seeking accommodations, lack of support by investment owners (shareholders), and lack of relevant subsidy incentives. The major contribution of this study is that hoteliers can understand important hindering factors associated with applying for green hotel certification; therefore, strategies that can encourage or enhance the green certification of hotels can be proposed to improve corporate image in the hotel industry, implement social responsibility in this industry, and obtain consumers' approval of and accommodation-willingness for green hotels.

Keywords: green hotel; corporate social responsibility; green hotel certification

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1. Introduction

Green business practices have become very popular with the wave of green and sustainable issues in recent years. Throughout the world, enterprises are adopting a variety of environmentally sustainable activities while managing their business operations [1,2]. One motivation for these changes is that many individuals and corporate customers consider the company's sustainable environmental performance when making purchasing decisions [3,4]. Of course, other reasons also exist, such as government supervision requirements, social responsibility requirements, and mandatory implementation of green practices in enterprises [5–8].

Taiwan is an island area composed of Taiwan Island and 121 small islands. Development on islands is affected by their remoteness, limited natural resources, small markets, marginal decision-making centers, unique internal structure, and vulnerability to natural disasters. The islands of various countries in the world, especially small islands, are geographically isolated from the mainland, resulting in differences in climate, topography, and physical environment, and each has its own natural and cultural characteristics. Taiwan is surrounded by the sea; its fishery resources are rich, the ecological environment is well preserved, and the natural landscape is dominated by ocean features, which constitute the greatest attractions of island tourism. Taiwan has unique natural resources and is an island with the potential to develop international ecological tourism. To help Taiwan move

towards green and sustainable development, this research analyzed expert data to identify the obstacles to applications for green hotel certification.

The hotel industry used to be regarded as a chimney-free industry [9–11]. However, with the increased range and level of services, energy consumption, amounts of waste and wastewater, and chemical emissions now have a considerable impact on the environment [12,13]. Most studies on green hotels in Taiwan areas have examined green hotel-related issues from the perspectives of consumers, whereas the difficulties in obtaining green hotel certification from the perspective of the hotelier have rarely been discussed [14,15]. Therefore, how hotels in Taiwan area make green changes and how they reduce energy consumption and damage to the environment, as well as the difficulties encountered in applying for green hotel certification, remain important and unanswered issues in the sustainable operation of green hotels in Taiwan.

Sustainability is currently one of the major priorities of tourism all over the world. One aspect of sustainable tourism is green management. According to the trends in the hotel industry, accommodation facilities have recognized that adopting green practices is beneficial [16]. The Environmental Protection Administration of Taiwan launched the "Green Mark" for the hotel industry in 2008 in response to the global demand for environmental protection and sustainable development; however, there were very few applicants. Therefore, the government re-launched the "Green Hotels" project with lower thresholds for environmental protection conditions in 2011 to shorten and reduce the review time and investment and increase the application willingness of hoteliers. However, by the end of February 2019, among 13,268 hotels in the tourism industry, only 1450 hotels, less than 10%, became green hotels [17]. There are only 64 hotels with a green mark certification [18]. This result indicates that hoteliers in Taiwan generally hold a reserved attitude towards green hotels, worry about the investment and service quality of green facilities, do not know how to proceed, or even do not understand the market benefit. What are the important factors that hinder the application for green hotel mark certification, and why is the number of hotels that obtain green mark certification not increasing as expected?

To address these questions, this study used the analytic hierarchy process (AHP) method to analyze the level of importance of each factor hindering the application for green hotel certification based on questionnaire surveys of industrial experts, government unit experts, scholars, and consumers. Finally, quantitative ranking of the level of importance of each hindering factor of application for green hotel mark certification, identified through the expert questionnaire surveys, was performed to provide a reference to aid in increasing the number of applications for green hotel certification in the future.

2. Background and Related Works

2.1. Impact of Data Science and Geographical Location on Taiwan's Green Certified Hotels

In recent years, Taiwanese governmental units have integrated tourism and information technology, promoted sustainable green tourism information services, integrated and established a "Taiwan Green Certificate Hotel Database" [18], and promoted tourism business models. At the same time, mastering the development trend of cloud technology combined with social media and mobile technology and gradually integrating various artificial intelligence tourism services is an important policy of Taiwan's tourism official unit. The O2O (online to offline) model has been widely used in Taiwan's tourism industry. Green hotels are trying to use a variety of online channels, including online travel agency (OTA) and hotel websites, to show their green certification to attract customers to their hotels. The OTA website provides certified green hotel geographical distribution information and marketing activities, helps introduce new customers to the green hotel, and provides information to enrich the OTA website (Figure 1). Therefore, applying for green hotel certification and attracting guests through OTA have become top priorities for hotel operators in Taiwan.

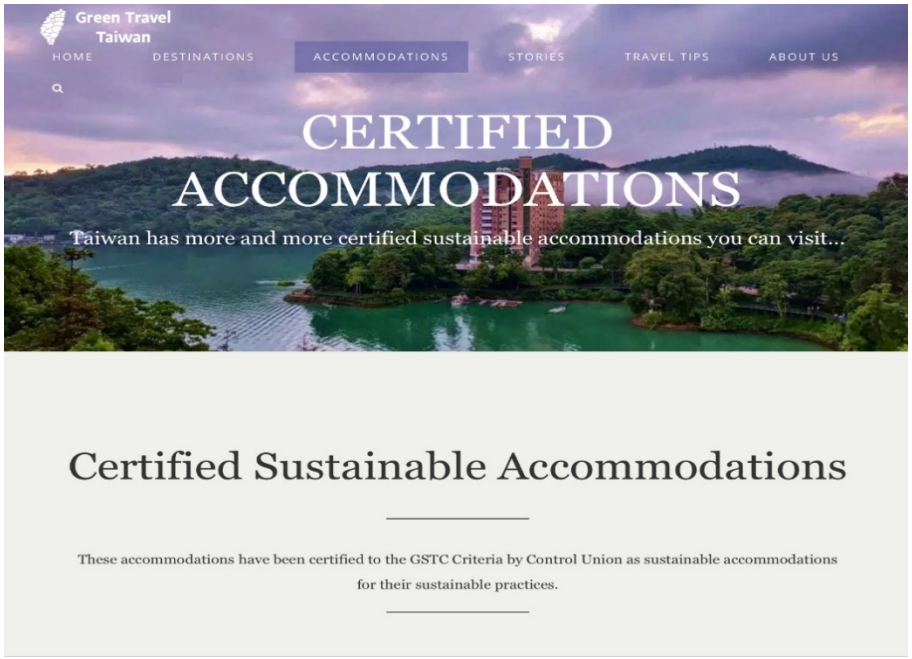

Figure 1. Green Hotel OTA website in Taiwan.

Factors affecting the location of green hotels include traffic conditions, geographical conditions, natural landscapes, and geographical location, and they have a certain impact on green hotels [19]. Popovic et al. [20] pointed out that the hotel's location should be considered as follows: geographical environment: beautiful and comfortable climate, cultural attraction, recreational opportunities, and surrounding environmental characteristics; accessibility: convenient transportation; natural limitations: topography and slope, hydrology, geology, plants and wildlife; environmental management: urban area division, building regulations, comfort and convenience, current land use, restrictions on future land and building changes. Fang et al. [21] found that hotel location factors include following: transaction advantages: the hotel's location close to the tourist destination; landscape factors: the landscape and public facilities near the area; convenience: including time and distance, highways, and railway connectivity; hotel environment: appropriateness of the surrounding environment.

Therefore, most hotels with green certification in Taiwan are concentrated in metropolitan areas (Table 1). Additionally, a city's geographical location will become an important key factor for green hotel certification because of the relevant subsidy incentives of cities in Taiwan, strict environmental laws and regulations for geographical locations, regional restrictions in cities, and land cost considerations.

Table 1. Distribution of Green Hotel Certificates in Taiwan.

Geographical Location	Certificates Level	Total
Urban	Gold	10
	Silver	15
	Copper	17
Country	Gold	4
	Silver	8
	Copper	10

Source: Environmental Protection Administration Executive Yuan, R.O.C. (Taiwan) [18].

2.2. Development of Green Hotel Certification

In the hotel and tourism field, consumers' understanding of the sustainable development of hotels is also increasing [6,16,22,23]. Therefore, hotel operators and managers

also recognize that hotels should actively participate in sustainable operations and environmental protection to attract customers with increasing green consciousness [24,25]. According to the global sustainable travel report released by Bookings.com, 65% of global travelers expressed their intention to stay in green hotels [26]. In response to the higher expectations of these environmentally conscious consumers regarding "green accommodations", many hotels have actively adopted green and sustainable environmental protection practices [16,23,27–29]. Most hotel operators have a positive awareness of green hotels and environmentally friendly labels and have a willingness to implement them. They agree that green hotels can help improve the hotel's image and energy-saving effects and are willing to implement environmental protection measures to help reduce hotel costs [30–32].

Green hotel certification is intended to provide a series of environmentally friendly standards and encourage the hotel industry to increase its environmental performance. Of approximately 140 green certification institutions for hotels, 50 eco-labels focus on green hotel certification [33]. The green hotel certification schemes vary; however, the majority of certifications include the following components: water, energy, waste, sustainable procurement, biodiversity conservation, community engagement, and architecture and design [34]. Reviewing the green hotel certification program is very important to understanding the key structural components of hotel environmental management.

The well-known Hilton hotels launched the corporate responsibility plan, "Travel with Purpose", in 2011. This plan includes not only social impacts but also environmental impacts to focus on effectively reducing energy, water, and waste output in environmental management [35]. TripAdvisor provides information about hotel environmental practices. The company negotiated with international expert organizations for sustainable development, the United Nations Environment Programme, and the International Tourism Organization to develop the TripAdvisor GreenLeaders program. The GreenLeaders program includes 6 components: energy, water, waste, purchasing, site, and innovation and education. The evaluation items include towel and linen reuse, electric car recharge stations, and solar panels. Hotels can apply for the TripAdvisor GreenLeaders program through completion of a self-evaluation survey. Hotels can achieve 1 of the 4 badge levels based on the environmental protection practice level: bronze, silver, gold, or platinum. More than 1000 hotels have obtained the TripAdvisor GreenLeaders award, including all major brands and many independent hotels. In addition, hotel customers can comment on the green practices of hotels to ensure the integrity of the program [36,37].

Green Seal is a nonprofit organization that provides environmental certification standards. These standards represent responsible choices for company purchasers and consumers to promote more effective sustainable development. Green Seal released 33 standards covering 400 product and service categories [38]. Green Seal regulates requirements for hotels and lodging properties. The Green Seal standard GS-33 for lodging properties has three levels: bronze, silver, and gold. Hotels can apply for green certification. Since its first launch in 1999, this green seal standard has become a method to help hotels to improve their environmental practices and develop into environmental leaders. This standard focuses on energy conservation, pollution prevention, waste minimization, water conservation, and freshwater resource management [39].

3. Materials and Methods

This study used the AHP method to analyze important factors that hinder hoteliers from applying for green hotel certification. In the study design, green hotel scholars and experts and hoteliers that already obtained green hotel certifications were first interviewed through meetings. In addition, previous related literature was collected using the literature analysis method to prepare the AHP questionnaire. Next, AHP was performed to categorize and rank important factors that hindered hoteliers from applying for green hotel certification.

3.1. Sampling Design

The sample selection of this study is based on the proportion of geographical distribution, and the invitation process is to invite participants through Email or telephone. As was explained to experts, the survey items were filled in from a professional perspective. Moreover, because most selected experts support the topic of green hotels, they were very enthusiastic to respond to the invitation and make suggestions. Because this research topic was professional, actual surveys were performed based on the research content to target hotel and environmental protection professionals with more than 15 years of experience in four fields—hotel industry professionals (five people), government unit professionals (4 people), academic professionals (four people), and consumer professionals (four people)—to determine the weight of each item. All of the above experts are professionals who are engaged in or have contact with fields closely related to this research topic. The survey was completed in 2020. Expert background information is provided in Table 2 below.

Table 2. Description of Participating Experts by the AHP method.

Items	Category	Professional Background
1	Consumer Representative	Consumer who has stayed in eco-hotels more than 10 times
2	Consumer Representative	General Manager, Housekeeping Supplier
3	Consumer Representative	General Manager, Enterprise Decorators
4	Consumer Representative	Cabin Chief, National
5	Government representative	Executive, Tourism Bureau, M.O.T.C. Republic of China (Taiwan)
6	Government representative	Executive, Tourism Bureau, M.O.T.C. Republic of China (Taiwan)
7	Government representative	Executive, Environmental Protection Administration, Executive Yuan, Republic of China (Taiwan)
8	Government representative	Executive, Department of Tourism
9	Academic Representative	Professor; Fields of research: Leisure and Tourism, Brand Image
10	Academic Representative	Professor; Fields of research: Green Hotel, Human Resources Management in the Hospitality Industry
11	Academic Representative	Professor; Fields of research: Corporate Sustainability, Corporate Social Responsibility
12	Academic Representative	Professor; Fields of research: Strategic Management of Ecotourism, Public Relations
13	Industrial Representative	22 years of experience working in hospitality industry; Director, International Hotel Chain
14	Industrial Representative	20 years of experience working in hospitality industry; the hotel has eco-hotel certification in Taiwan
15	Industrial Representative	16 years of experience working in hospitality industry; the hotel has eco-hotel certification in Taiwan
16	Industrial Representative	15 years of experience working in hospitality industry; the hotel has eco-hotel certification in Taiwan
17	Industrial Representative	15 years of experience working in hospitality industry; the hotel has eco-hotel certification in Taiwan

Before the study was officially conducted, all indices that hindered green hotel certification were explained to the respondents in detail to avoid confusion and to effectively establish the understanding of respondents on each index and their relationship. After invalid questionnaires such as those with missing answers were excluded, consistency statistical verification was performed. The results showed that recovered questionnaires all conformed to the standard of the consistency ratio (CR) value lower than 0.10. Therefore, there were, in total, 17 copies of valid recovered questionnaires. This study used the post-event method to calculate weighted values of each index in valid recovered questionnaires

based on the AHP guidelines. In addition, individual and overall weights were analyzed based on their professional attribute categories to evaluate each index.

3.2. Application of the AHP Method for Indicators That Hindered Green Hotel Certification

The AHP method is mainly applied in uncertain conditions and decision-making issues with many evaluation criteria. The application scope of AHP is very diverse, especially in planning, prediction, judgement, resource allocation, and portfolio trials [40]. AHP analyses and divides complicated questions into several hierarchies to establish a hierarchical structure with mutual influence. It decomposes step-by-step from high hierarchies to low hierarchies. Through quantitative judgement, AHP simplifies and improves the previous decision-making procedures of decision makers who relied on instinct to obtain priority-weighted values of all schemes. The hierarchical relationship can provide a logical approach to evaluation for decision makers to select appropriate schemes. Schemes with higher priority-weighted values have higher priority orders of acceptance. Therefore, the risk of mistakes in decision making is reduced. The procedure of the AHP method is divided into eight steps [41].

1. Decision-making issues are identified, and evaluation indicators are listed.

The definition of the research topic is determined, the scope of the problems is analyzed and defined, and the purpose of decision making is confirmed. Next, opinions of experts and decision makers are integrated. The relevant evaluation criteria of the decision-making problems are listed, the criteria are defined, and the criteria are categorized into different hierarchies.

2. The hierarchical structure is constructed

All viewpoints of decision makers are repeatedly amended, using the group discussion method or referencing relevant literature and expert opinions, and summarized to establish the target-scheme hierarchical structure.

3. Pairwise comparisons are performed for evaluation

After the hierarchical structure is established, the next step is the evaluation task. Indices in the upper hierarchy are mainly used as the baseline. Pairwise comparisons between the relative importance of the index to the upper hierarchy of any two indices at the same hierarchy are performed. If there are n indices, $n(n-1)/2$ pairwise comparisons should be performed to determine the relative importance among all indices at the same level of the hierarchy.

4. The matrix at each level of the hierarchy is developed according to step 3 to construct all evaluation matrices.

This study targeted sub-hierarchies of all hierarchies to perform pairwise comparisons to obtain all evaluation matrices. Evaluation matrices of all hierarchies are constructed according to the following Formula (1):

$$[A_k] = [a_{ij}] = \begin{bmatrix} 1 & a_{12} & \cdots & a_{1n} \\ 1/a_{12} & 1 & & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ 1/a_{1n} & 1/a_{2n} & \cdots & 1 \end{bmatrix}, \mathrm{k} = 1, 2, \cdots, \mathrm{n}, \quad (1)$$

where *Ak* is the evaluation matrix at each hierarchy;
i is the hierarchical code;
j is the index code;
k is the expert code; and
a is the matrix of each hierarchy.

5. Pairwise comparison matrices are constructed, priority vectors are calculated, and consistency is examined.

According to evaluation data obtained in step 3, a pairwise comparison matrix is constructed and is called the positive reciprocal matrix. Based on the constructed pairwise comparison matrix, the eigenvector and the maximized eigenvalue (λmax) are calculated. Next, the values of differences between the maximized eigenvalue and n indices are converted into the consistency index (CI). The ratio between indices in the evaluation matrix is measured and used as the reference for whether the pairwise comparison matrix is acceptable. The consistency is examined using the following Formula (2):

$$C\ I = (\lambda_{max} - n)/(n-1). \quad (2)$$

The consistency index of the randomly produced positive reciprocal matrix is the random index (RI). Using the above CI and RI, the consistency ratio of the pairwise comparison matrix is obtained, CR = CI/RI.

6. All hierarchies are subject to steps 3–5 and connected according to each hierarchy.
7. The total priority weight of the overall hierarchy is calculated.

The relative weights of indices in all hierarchies are integrated to calculate the total priority weight of the overall hierarchy. The calculated weight represents the relative priority order of all decision-making schemes corresponding to the decision-making target. This study targeted experts in four individual fields (industry experts, government unit representatives, scholars, and consumers) to separately calculate the index weights of all hierarchies to evaluate the priority order of all indices and determine the quantitative ranking of the levels of importance of hindering factors of application for green hotel mark certification.

8. The consistency of the overall hierarchy is evaluated.

The CR of the overall hierarchy is mainly the consistency index of the hierarchy (CIH) divided by the random index of the hierarchy (RIH). Therefore, the consistency ratio of the overall hierarchy (CRH) should be smaller than 0.10. If this standard is not met, evaluation should be amended again to improve the CR. In summary, the CRH was smaller than 0.10. The AHP questionnaire design of this research is based on the environmental hotel-related literature and a survey of experts (list of experts is shown in Table 1). A total of 26 indicators that affect the application for environmental hotel certification are classified into five major categories: hotel internal environment, hotel external environment, hotel laws and regulations policy, environmental protection incentive policy, and consumers' environmental awareness, as shown in Figure 2.

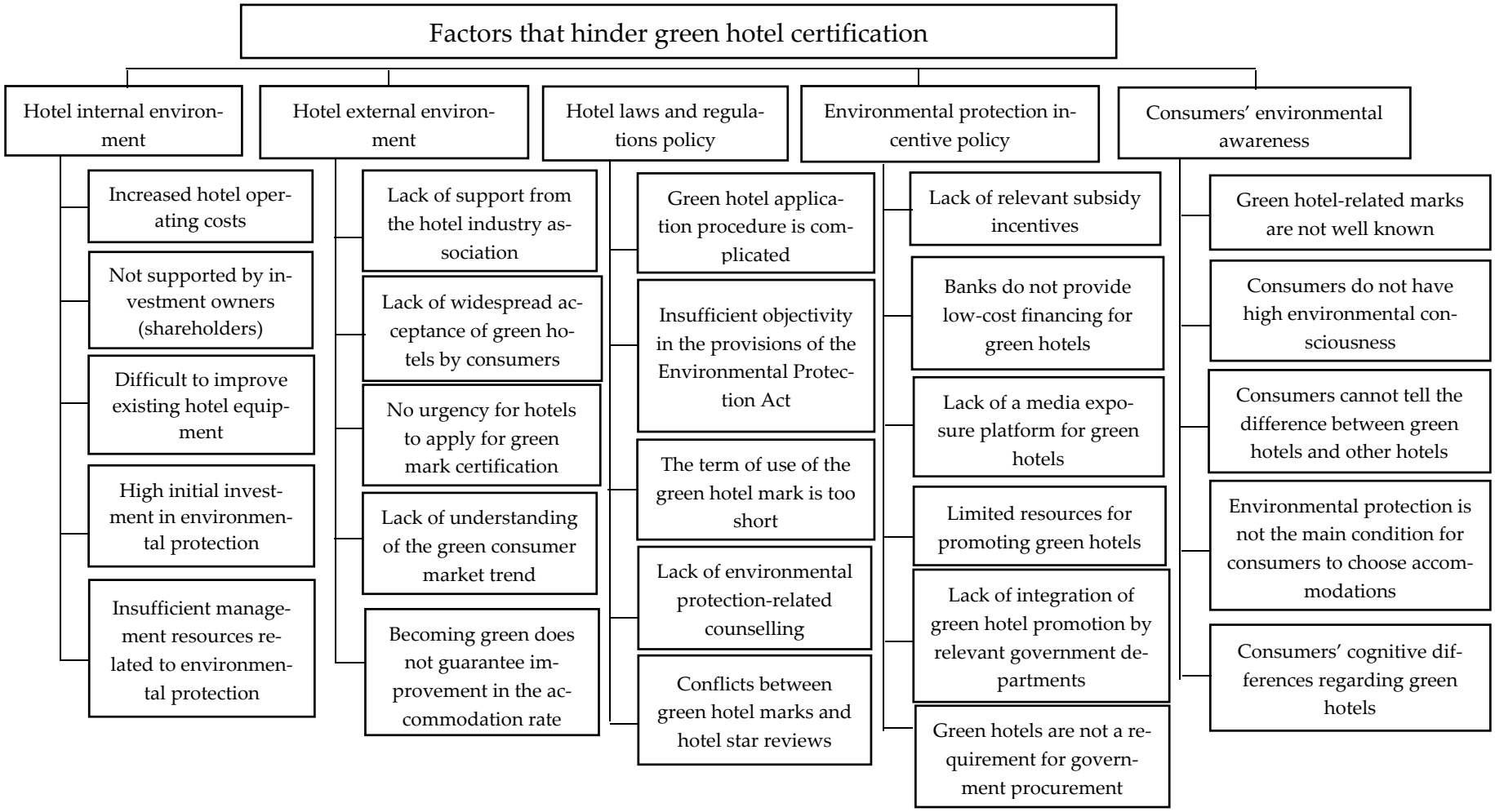

Figure 2. The hierarchical structure of hindering factors of green hotel certification.

4. Results

4.1. AHP Analysis of Hindering Indices of Green Hotel Certification by Scholars and Experts

Table 3 shows that "hotel internal environment" (0.262) was the most important index, followed by "consumers' environmental awareness" (0.258) and "environmental protection incentive policy" (0.204). These results indicated that scholars and experts overall considered that the hotel internal environment was the index with the highest level of hindrance in green hotel certification.

Table 3. Analysis of hindering indices of application for green hotel certification considered by scholars and experts.

Dimension	Index	Weight	Relative Weight	Ranking
Hotel internal environment 0.262	Increased hotel operating costs	0.181	0.037	11
	Not supported by investment owners (shareholders)	0.345	0.093	2
	Difficult to improve existing hotel equipment	0.189	0.049	6
	High initial investment in environmental protection	0.223	0.060	4
	Hotel has insufficient management resources related to environmental protection	0.063	0.014	24
Hotel external environment 0.106	Lack of support from the hotel industry association	0.097	0.008	26
	Lack of widespread acceptance of green hotels by consumers	0.305	0.037	12
	No urgency for hotels to apply for green mark certification	0.131	0.011	25
	Lack of understanding of the green (environmental protection) consumer market trend	0.119	0.015	23
	Becoming green does not guarantee improvement in the accommodation rate	0.348	0.033	14
Hotel laws and regulations policy 0.170	Green hotel application procedure is complicated	0.311	0.049	7
	Insufficient objectivity in the provisions of the Environmental Protection Act	0.128	0.021	22
	The term of use of the green hotel mark is too short	0.116	0.023	20
	Lack of environmental protection-related counselling mechanisms	0.251	0.042	10
	Conflicts between green hotel marks and hotel star reviews	0.193	0.031	15
Environmental protection incentive policy 0.204	Lack of relevant subsidy incentives	0.322	0.075	3
	Banks do not provide low-cost financing for green hotels	0.112	0.021	21
	Lack of media exposure platform for green hotels	0.121	0.024	19
	Limited resources for promoting green hotels	0.176	0.028	18
	Lack of integration of green hotel promotion by relevant government departments	0.162	0.028	17
	Green hotels are not a requirement for government procurement	0.107	0.031	16
Consumers' environmental awareness 0.258	Green hotel-related marks are not well known	0.171	0.044	8
	Consumers do not have high environmental consciousness	0.147	0.050	5
	Consumers cannot tell the difference between green hotels and other hotels	0.141	0.035	13
	Environmental protection is not the main condition for consumers to choose accommodations	0.375	0.099	1
	Consumers' cognitive differences regarding green hotels	0.166	0.043	9

Regarding the index weights within each individual dimension, in the hotel internal environment dimension, "not supported by investment owners (shareholders)" had the highest weight (0.345), followed by "high initial investment in environmental protection" (0.223) and "difficult to improve existing hotel equipment" (0.189). In the hotel external environment dimension, "becoming green does not guarantee improvement in the accommodation rate" had the highest weight (0.348), followed by "lack of widespread acceptance of green hotels by consumers" (0.305) and "no urgency for hotels to apply for green mark certification" (0.131). In the hotel laws and regulations policy dimension, "green hotel application procedure is complicated" had the highest weight (0.311), followed by "lack of environmental protection-related counselling mechanisms" (0.251) and "conflicts between green hotel marks and hotel star reviews" (0.193). In the environmental protection incentive

policy dimension, "lack of relevant subsidy incentives" had the highest weight (0.322), followed by "limited resources for promoting green hotels" (0.176) and "lack of integration of green hotel promotion by relevant government departments" (0.162). In the consumers' environmental awareness dimension, "environmental protection is not the main condition for consumers to choose accommodations" had the highest weight (0.375), followed by "green hotel-related marks are not well known" (0.171) and "consumers' cognitive differences regarding green hotels" (0.166).

Furthermore, the relative weights of all indices were determined. Overall, the scholar and expert representatives expressed that "environmental protection is not the main condition for consumers to choose accommodations" (0.099) had the highest relative weight among all indices. This result indicated that these representatives believed that the most critical factor hindering green hotel certification was this index, followed by "not supported by investment owners (shareholders)" (0.093) and "lack of relevant subsidy incentives" (0.075).

4.2. Analysis of the Relative Weighted Ranking of Indices That Hindered Green Hotel Certification Considered by All Scholars and Experts

In the analysis of the relative weighted ranking of indices that hindered green hotel certification, this study ranked the relative weights considered by scholars and experts in all fields and performed comprehensive analyses targeting consumer representatives, government representatives, academic representatives, and industry representatives to understand the concentration level of ranking of all indices. Table 4 shows that the results were mainly divided into: 1. high-ranking concentration indices (indices concentrated in the top five of all fields), 2. low-ranking concentration indices (indices concentrated in the bottom five of all fields, and 3. differential ranking indices (indices ranked in both the top five and the bottom five).

In the high-ranking indices, "environmental protection is not the main condition for consumers to choose accommodations" was a high-ranking concentration index. The results showed that consumer representatives and industry representatives all considered that the relative weight of this index was the overall number 1 in ranking, and academic representatives considered it number 3. The second was "not supported by investment owners (shareholders)". The results showed that government representatives and academic representatives all considered that the relative weight of this index is the overall number 1 in ranking, and industry representatives considered it number 4. The next was "lack of relevant subsidy incentives". The results showed that government representatives and academic representatives all considered that the relative weight of this index is the overall number 2 in ranking, and consumer representatives considered it number 3.

In the low-ranking indices, "lack of support from the hotel industry association" was the low-ranking concentration index. The results showed that consumer representatives and academic representatives all considered that the relative weight of this index was last in the overall ranking (26th place), and industry representatives considered it to be second to last (25th place), followed by "lack of understanding of the green (environmental protection) consumer market trend". The results showed that academic representatives considered that the relative weight of this index was the second to last in the overall ranking (25th place), consumer representatives considered it to be third to last (23rd place), and government representatives considered it to be fourth to last (22nd place). The next was "no urgency for hotels to apply for green mark certification". The results showed that government representatives considered that the relative weight of this index was second to last in the overall ranking (25th), and consumer representatives considered it to be third to last (24th place).

Table 4. Analysis of rankings of the relative weights of indices that hindered green hotel certification, as indicated by all scholars and experts.

Dimension	Index	Consumer Representatives	Government Representatives	Academic Representatives	Industry Representatives
		Ranking			
Hotel internal environment	Increased hotel operating costs	12	20	7	10
	Not supported by investment owners (shareholders)	21	1	1	4
	Difficult to improve existing hotel equipment	18	5	18	2
	High initial investment in environmental protection	6	6	13	3
	Hotel has insufficient management resources related to environmental protection	25	21	24	14
Hotel external environment	Lack of support from the hotel industry association	26	17	26	25
	Lack of widespread acceptance of green hotels by consumers	14	26	9	5
	No urgency for hotels to apply for green mark certification	24	25	20	17
	Lack of understanding of the green consumer market trend	23	22	25	15
	Becoming green does not guarantee improvement in the accommodation rate	13	16	14	13
Hotel laws and regulations policy	Green hotel application procedure is complicated	8	4	21	7
	Insufficient objectivity in the provisions of the Environmental Protection Act	17	14	19	19
	The term of use of the green hotel mark is too short	5	15	22	23
	Lack of environmental protection-related counselling mechanisms	20	3	15	8
	Conflicts between green hotel marks and hotel star reviews	2	24	10	20
Environmental protection incentive policy	Lack of relevant subsidy incentives	3	2	2	16
	Banks do not provide low-cost financing for green hotels	11	11	23	24
	Lack of media exposure platform for green hotels	19	7	16	22
	Limited resources for promoting green hotels	22	9	8	18
	Lack of integration of green hotel promotion by relevant government departments	10	13	12	21
	Green hotels are not a requirement for government procurement	4	8	17	26
Consumers' environmental awareness	Green hotel-related marks are not well known	16	12	5	11
	Consumers do not have high environmental protection consciousness	7	23	4	12
	Consumers cannot tell the difference between green hotels and other hotels	15	18	11	6
	Environmental protection is not the main condition for consumers to choose accommodations	1	10	3	1
	Consumers' cognitive differences regarding green hotels	9	19	6	9

In the differential ranking of indices, "green hotels are not a requirement for government procurement" had the largest difference in the ranking of overall indices. The results indicated that consumer representatives considered that the relative weight of this index to be ranked fourth among the overall indices, and industry representatives considered it to be in last place (26th place). The next was "conflicts between green hotel marks and hotel star reviews". The results indicated that consumer representatives considered that the relative weight of this index overall ranked second, and government representatives considered it to rank third to last (24th place). The next was "Lack of widespread acceptance of green hotels by consumers". Industry representatives considered that the relative weight of this index ranked fifth among all indices, and government representatives considered it to be ranked last (26th place).

In summary, this study compared the ranking in the fields of consumer representatives, government representatives, academic representatives, and industry representatives and showed that the ranking of the relative weights of some indices had high degrees of concentration, showing that scholars and experts in all fields agreed on the degree of hindrance of that index, whereas there were opposite opinions on some indices. Therefore, green hotel promotion involves different fields and scholars. Experts in all fields had different subjective experiences on green hotel application hindrance and had different opinions on the levels of hindrance.

5. Discussion

Green hotels are a current trend in tourism accommodation, and the distribution of green hotels is related to the environmental protection of tourism-related geography. The indicators revealed in this research can provide a reference for increasing applications for green hotels and illustrate the importance of regional geography to the environmental ecology. This study analyzed five important index dimensions: hotel internal environment, hotel external environment, hotel laws and regulations policy, environmental protection incentive policy, and consumers' environmental awareness. The study results are summarized and discussed below.

The "not supported by investment owners (shareholders)" index, "difficult to improve existing hotel equipment" index, and "high initial investment in environmental protection" index ranked second, sixth, and fourth, respectively, in the overall ranking of indices by scholars and experts. These results indicated that the thinking of hoteliers and the recognition of hotels' senior executives were important factors affecting the willingness of hoteliers to participate in green hotel certification. "Not supported by investment shareholders" and "high initial investment in environmental protection" were important factors hindering hoteliers from applying for green marks. This result is consistent with Chan et al. [42], Iorgulescu [43], and Moon et al. [44]. Although the hotel industry has an incentive to invest in environmentally friendly hotels, it is currently adopting a wait-and-see attitude due to input cost considerations and uncertainty in output performance.

These five indices—"lack of support from the hotel industry association", "lack of widespread acceptance of green hotels by consumers", "no urgency for hotels to apply for green mark certification", "lack of understanding of the green (environmental protection) consumer market trend", and "becoming green does not guarantee improvement in the accommodation rate"—in the analysis of overall ranking by overall scholars and experts were all not in the top 10, whereas the ranking of "hotel external environment dimension" was ranked last among five dimensions.

The "green hotel application procedure is complicated" index ranked 7th in the analysis of overall rankings of indices by scholars and experts. The results indicated that the certification process of many green hotel marks in Taiwan is too complicated, and the content of green mark requirements is not clear. This result is consistent with Suryawan and Aris [45], Nelson et al. [46], and Sharma et al. [47]. Many hoteliers expressed that the label certification procedures are too complicated, and they are not clear about the content of the green label items.

The "lack of relevant subsidy incentives" index ranked third in the analysis of overall ranking of indices by scholars and experts. This result is consistent with Heras-Saizarbitoria et al. [48] and dos Santos et al. [49]. The increase in incentives is a very important planning consideration for groups targeted by the policy. The government should start with subsidies and environmental protection tax incentives to directly encourage hoteliers to implement green hotels, and relevant incentive measures by the government are an important hindering factor affecting hoteliers from applying for green marks.

The "environmental protection is not the main condition for consumers to choose accommodations" and "consumers do not have high environmental protection consciousness" indices ranked first and fifth in the analysis of the overall rankings of indices by scholars and experts, respectively. The results indicated that when consumers choose hotels for accommodations, green hotels will not be listed as a factor in purchasing decisions. Consumer consider price and only have economic motivation [50–52].

6. Conclusions

The "environmental protection is not the main condition for consumers to choose accommodations" index in the analysis of indices by consumer representatives and hotel industry representatives was ranked 1st in both rankings. Therefore, hoteliers understand very clearly that consumers still use the economic factor as the priority in the accommodation selection environment [53]. Hoteliers should target environmental behaviors such as consumers bringing their own toiletries to give substantial price discounts in the practical operations. The "not supported by investment owners (shareholders)" index ranked first in the analysis of indices by government representatives and academic representatives. Therefore, the major decision makers of the hotels are still owners (shareholders). The attitude of owners (shareowners) is an important factor determining whether the promotion of government policy succeeds or fails. It is recommended that government units seek assistance from hotel associations in all counties and cities to promote green hotels and strengthen education about the environment in the ventures undertaken by owners (shareholders). In addition, counselling and promotion can be immediately performed when hotels apply for certification. In addition, hotels planned and established using the standard of green hotels should be opened. Furthermore, when hotels actually obtain green hotel mark certification after formal operations, they can also apply for subsidies to increase the application willingness of hoteliers. The contributions of this research are as follows: through the analysis of the actual data indicators of the tourism experts in this research, we know that the current official government tourism-related units in the Taiwan region recognize the policy effectiveness of the environmentally friendly hotel label system. In discussing the obstacles to the environmental labelling of hotels, this study collected opinions from tourism experts, and the expert data presented by AHP can be used by official tourism organizations and tour operators in Taiwan as a reference, and the impact of various related factors can be explored and prioritized.

7. Limitations and Future Studies

Experts in the fields in this study were limited to the Taiwanese area. It is recommended that researchers in the future expand the sources and categories of experts to make them more representative; thus, the study results will not be influenced by the regions in which the experts are located. This study only targeted the hindering factors of green mark certification in the Taiwanese area. Because the implementation time of green hotels in various countries around the world is earlier than that in Taiwan, it is suggested that subsequent researchers target hindrance of implementation of green hotels in different countries to perform in-depth studies and compare the results with the factors hindering the implementation of green hotels in Taiwan. In addition, we believe that the comparison from the perspectives of hoteliers and the perspectives of consumers would help us better understand the factors affecting the promotion of green hotel marks.

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References

1. Gast, J.; Gundolf, K.; Cesinger, B. Doing business in a green way: A systematic review of the ecological sustainability entrepreneurship literature and future research directions. *J. Clean. Prod.* **2017**, *147*, 44–56. [CrossRef]
2. Sharma, V.K.; Chandna, P.; Bhardwaj, A. Green supply chain management related performance indicators in Agro industry: A review. *J. Clean. Prod.* **2017**, *141*, 1194–1208. [CrossRef]
3. Guyader, H.; Ottosson, M.; Witell, L. You can't buy what you can't see: Retailer practices to increase the green premium. *J. Retail. Consum. Serv.* **2017**, *34*, 319–325. [CrossRef]
4. Zhang, H.; Yang, F. On the drivers and performance outcomes of green practices adoption. *Ind. Manag. Data Syst.* **2016**, *116*, 2011–2034. [CrossRef]
5. Govindan, K.; Diabat, A.; Madan Shankar, K. Analyzing the drivers of green manufacturing with fuzzy approach. *J. Clean. Prod.* **2015**, *96*, 182–193. [CrossRef]
6. Verma, V.K.; Chandra, B.; Kumar, S. Values and ascribed responsibility to predict consumers' attitude and concern towards green hotel visit intention. *J. Bus. Res.* **2019**, *96*, 206–216. [CrossRef]
7. Miisso, R.; Andreopoulou, Z.; Cesaretti, G.P.; Hanna, S.S.; Tzoulis, I. Sustainable development and green tourism: New practices for excellence in the digital era. *J. Int. Bus. Entrep. Dev.* **2018**, *11*, 65–74. [CrossRef]
8. Crespi, G.; Becchio, C.; Buso, T.; Corgnati, S.P. Environmental performances in green labels for hotels—A critical review. In *International Symposium: New Metropolitan Perspectives*; Crespi, G., Becchio, C., Buso, T., Corgnati, S.P., Eds.; Springer: Cham, Switzerland, 2020; pp. 1176–1186.
9. Gupta, A.; Dash, S.; Mishra, A. All that glitters is not green: Creating trustworthy ecofriendly services at green hotels. *Tour. Manag.* **2019**, *70*, 155–169. [CrossRef]
10. Jiang, Y.; Gao, Y. Factors that influence potential green hotel customers' decision-making process—Evidence from China. *J. China Tour. Res.* **2019**, *15*, 1–23. [CrossRef]
11. Yadav, R.; Balaji, M.S.; Jebarajakirthy, C. How psychological and contextual factors contribute to travelers' propensity to choose green hotels? *Int. J. Hosp. Manag.* **2019**, *77*, 385–395. [CrossRef]
12. Chen, H.; Bernard, S.; Rahman, I. Greenwashing in hotels: A structural model of trust and behavioral intentions. *J. Clean. Prod.* **2019**, *206*, 326–335. [CrossRef]
13. Kularatne, T.; Wilson, C.; Månsson, J.; Hoang, V.; Lee, B. Do environmentally sustainable practices make hotels more efficient? A study of major hotels in Sri Lanka. *Tour. Manag.* **2019**, *71*, 213–225. [CrossRef]
14. Yeh, S.S.; Guan, X.; Chiang, T.Y.; Ho, J.L.; Huan, T.C.T.C. Reinterpreting the theory of planned behavior and its application to green hotel consumption intention. *Int. J. Hosp. Manag.* **2021**, *94*, 102827. [CrossRef]
15. Han, H. Theory of green purchase behavior (TGPB): A new theory for sustainable consumption of green hotel and green restaurant products. *Bus. Strategy Environ.* **2020**, *29*, 2815–2828. [CrossRef]
16. Scholz, P.; Voracek, J. Organizational culture and green management: Innovative way ahead in hotel industry. *Meas. Bus. Excell.* **2016**, *20*, 41–52. [CrossRef]
17. Tourism Bureau; Ministry of Transportation and Communications. Traveling Industry Related Statistics. Available online: https://admin.taiwan.net.tw/FileUploadCategoryListC003330.aspx?CategoryID=a7cf8979-fa4b-4473-98eb-86467e19dbbb&appname=FileUploadCategoryListC003330 (accessed on 20 March 2021).
18. Environmental Protection Administration. Executive Yuan; R. O. C. Green Hotel Annual Statistics. Available online: https://greenliving.epa.gov.tw/GreenLife/walksing2013/Statistics.aspx (accessed on 20 March 2021).
19. Mandić, A.; Petrić, L. The impacts of location and attributes of protected natural areas on hotel prices: Implications for sustainable tourism development. *Environ. Dev. Sustain.* **2021**, *23*, 833–863. [CrossRef]
20. Popovic, G.; Stanujkic, D.; Brzakovic, M.; Karabasevic, D. A multiple-criteria decision-making model for the selection of a hotel location. *Land Use Policy* **2019**, *84*, 49–58. [CrossRef]
21. Fang, L.; Li, H.; Li, M. Does hotel location tell a true story? Evidence from geographically weighted regression analysis of hotels in Hong Kong. *Tour. Manag.* **2019**, *72*, 78–91. [CrossRef]

22. Choi, H.M.; Kim, W.G.; Kim, Y.J.; Agmapisarn, C. Hotel environmental management initiative (HEMI) scale development. *Int. J. Hosp. Manag.* **2019**, *77*, 562–572. [CrossRef]
23. Scholz, P. Implementation of the green management on an example of the first class accommodation facilities in Prague. In Proceedings of the 4th Biannual CER Comparative European Research Conference, London, UK, 26–30 October 2015; pp. 9–12.
24. Kim, W.G.; Li, J.; Han, J.S.; Kim, Y. The influence of recent hotel amenities and green practices on guests' price premium and revisit intention. *Tour. Econ.* **2015**, *23*, 577–593. [CrossRef]
25. Ting, C.T.; Hsieh, C.M.; Chang, H.P.; Chen, H.S. Environmental consciousness and green customer behavior: The moderating roles of incentive mechanisms. *Sustainability* **2019**, *11*, 819. [CrossRef]
26. Booking.com. Booking.com Reveals 2017 Sustainable Travel Intentions, Goals and Considerations. Available online: https://news.booking.com/bookingcom-reveals-2017-sustainable-travel-intentions-goals-and-considerations (accessed on 18 January 2021).
27. Chou, C.J. Hotels' environmental policies and employee personal environmental beliefs: Interactions and outcomes. *Tour. Manag.* **2014**, *40*, 436–446. [CrossRef]
28. Han, H.; Lee, J.S.; Trang, H.L.T.; Kim, W. Water conservation and waste reduction management for increasing guest loyalty and green hotel practices. *Int. J. Hosp. Manag.* **2018**, *75*, 58–66. [CrossRef]
29. Park, J.; Kim, H.J.; McCleary, K.W. The impact of top management's environmental attitudes on hotel companies' environmental management. *J. Hosp. Tour. Res.* **2014**, *38*, 95–115. [CrossRef]
30. Liu, G.; Tan, Y.; Li, X. China's policies of building green retrofit: A state-of-the-art overview. *Build. Environ.* **2020**, *169*, 106554. [CrossRef]
31. Jaykumar, P. The triumphs & challenges in the path of green hotel housekeeping. *J. Serv. Res.* **2020**, *20*, 21–37.
32. Hou, H.; Wu, H. Tourists' perceptions of green building design and their intention of staying in green hotel. *Tour. Hosp. Res.* **2021**, *21*, 115–128. [CrossRef]
33. Green Hotel World. Global Green Hotel Density. Available online: https://www.greenhotelworld.com (accessed on 18 January 2021).
34. Siobhan, O.N. Know How Guide to Sustainable Hotel Certification Schemes. Available online: http://www.greenhotelier.org/know-how-guides/know-how-guide-to-sustainable-hotel-certification-schemes/ (accessed on 18 January 2021).
35. Hilton. Environmental Impact. Available online: https://cr.hilton.com/environment/ (accessed on 18 January 2021).
36. Hasek, G. Three Years After Launch, Tripadvisor Greenleaders Tops 11,000 Participants. Available online: http://www.greenlodgingnews.com/three-years-after-launch-tripadvisor-greenleaders/ (accessed on 18 January 2021).
37. TripAdvisor. Your Eco-Friendly Stay Starts Here. Available online: https://www.tripadvisor.com/GreenLeaders (accessed on 18 January 2021).
38. Green Seal. Certification Checklists. Available online: http://www.greenseal.org/GreenBusiness/Certification/Getcertified/CertificationChecklists.aspx (accessed on 18 January 2021).
39. Green Seal. Get Certified. Available online: http://www.greenseal.org/GreenBusiness/Certification/GetCertified.aspx (accessed on 18 January 2021).
40. Harker, P.T.; Vargas, L.G. The theory of ratio scale estimation: Saaty's analytic hierarchy process. *Manag. Sci.* **1987**, *33*, 1383–1403. [CrossRef]
41. Chen, Y.C.; Yu, T.H.; Tsui, P.L.; Lee, C.S. A fuzzy AHP approach to construct international hotel spa atmosphere evaluation model. *Qual. Quant.* **2014**, *48*, 645–657. [CrossRef]
42. Chan, E.S.W.; Okumus, F.; Chan, W. What hinders hotels' adoption of environmental technologies: A quantitative study. *Int. J. Hosp. Manag.* **2020**, *84*, 102324. [CrossRef]
43. Iorgulescu, M.C. An insight into green practices and eco-labels in the hotel industry. In Proceedings of the 6th BASIQ International Conference on New Trends in Sustainable Business and Consumption, Messina, Italy, 4–6 June 2020; Bucharest: ASE. pp. 1164–1171.
44. Moon, C.; Batle, J.; Morales, M. Eco-innovation in the hotel industry: A review of seven hotels using the UNWTO 2030 sustainability guidelines. In Proceedings of the International Conference on Tourism Research, Valencia, Spain, 27–28 March 2020; pp. 365–366.
45. Suryawan, I.G.B.; Aris, I. Strengthening environmental law policy and its influence on environmental sustainability performance: Empirical studies of green constitution in adopting countries. *Int. J. Energy Econ. Policy* **2020**, *10*, 132–138. [CrossRef]
46. Nelson, K.M.; Partelow, S.; Stäbler, M.; Graci, S.; Fujitani, M. Tourist willingness to pay for local green hotel certification. *PLoS ONE* **2021**, *16*, e0245953. [CrossRef] [PubMed]
47. Sharma, T.; Chen, J.; Liu, W.Y. Eco-innovation in hospitality research (1998-2018): A systematic review. *Int. J. Contemp. Hosp. Manag.* **2020**, *32*, 913–933. [CrossRef]
48. Heras-Saizarbitoria, I.; Boiral, O.; Allur, E.; García, M. Communicating environmental management certification: Signaling without signals? *Bus. Strategy Environ.* **2020**, *29*, 422–431. [CrossRef]
49. Dos Santos, R.A.; Méxas, M.P.; Meiriño, M.J.; Sampaio, M.C.; Costa, H.G. Criteria for assessing a sustainable hotel business. *J. Clean. Prod.* **2020**, *262*, 121347. [CrossRef]
50. Rawashdeh, A.A.; Al-Ababneh, M.M. Hotel guests' perceptions of environmentally friendly practices in Jordan. *J. Environ. Manag. Tour.* **2021**, *12*, 107–120. [CrossRef]
51. Chung, K.C. Green marketing orientation: Achieving sustainable development in green hotel management. *J. Hosp. Mark. Manag.* **2020**, *29*, 722–738. [CrossRef]

52. Dani, R.; Tiwari, K.; Negi, P. Ecological approach towards sustainability in hotel industry. *Mater. Today Proc.* **2021**. [CrossRef]
53. Yu, C.C.; Liu, C.C. Applying fuzzy AHP to evaluate the key selection criteria for green hotel operation managers. *J. Bus. Manag. Sci.* **2021**, *9*, 12–16. [CrossRef]