



## Article

# Investigating the Role of Green Hotel Sustainable Strategies to Improve Customer Cognitive and Affective Image: Evidence from PLS-SEM and fsQCA

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**Abstract:** Partial least square structural equation modeling (PLS-SEM) and fuzzy-set qualitative comparative analysis (fsQCA) were used to uncover the determinants of customers' overall positive image of green hotels, which can affect behavioral intentions. A sample of 323 customers of 54 four- and five-star "green" hotels in the Sultanate of Oman were surveyed. The findings can explain the complex process shaping customers' perceived image. The fsQCA analysis shows that the overall positive image of green hotels was driven by the interaction of two core conditions, environmental values and cognitive image, and one peripheral condition, low-carbon knowledge. Together, these factors are sufficient to form a favorable image of eco-hotels and could make a favorable affective image unnecessary. The PLS-SEM approach clarifies that this process takes place through an indirect mechanism wherein environmental values and low-carbon knowledge shape customers' cognitive image, which then boosts the overall positive image of eco-hotels. Such comprehensive insights address the gap in the body of literature vis à vis the influence of customers' psychological factors through cognitive and affective images. Theoretical and practical implications are examined.

**Keywords:** low-carbon knowledge; eco-hotel; environmental values; customers' image; word of mouth; revisit intention; premium



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## 1. Introduction

Environmental issues have become a major focus for present and future studies. The tourism sector is considered to be among the most environmentally harmful, alongside the industrial sector [1]. Hotels are one of the main segments of this sector that affect and harm the environment because they consume water and energy intensively [2]. Thus, over the last decade, researchers and practitioners have focused on convincing the lodging sector to be more environmentally friendly (also known as eco-friendly or "green") by implementing a wide range of specific criteria and green practices. The goal has been both to eliminate the negative impact of hotels on the environment and to meet the expectations of green customers, who value eco-friendly products, practices, and policies [3,4]. Previous studies have found that the number of hotels using green practices or applying sustainable strategies is increasing to meet the growing demand for green hotels as customers become more focused on the importance of protecting the environment [5,6] and seek green consciousness in lodging management [7]. In this vein, sustainable strategies are enterprises that use green best-practices in maintenance, services, logistics, goods, and suppliers to drastically reduce their environmental effect. The main components are waste reduction,

energy conservation, and water conservation [8]. For example, Ref. [9] found that around 92% of customers positively supported businesses that applied environmental criteria or followed environmental protection practices. Moreover, Ref. [10] found that eco-friendly behavior was considered civilized behavior. The hospitality industry and academia have become proactive in creating and developing environmental programs for hotels that can increase their competitiveness and attract these sustainability-minded travelers.

Previous studies focused on studying consumer behavior regarding eco-friendly hotels, customers' intentions to use such hotels, and customer satisfaction and revisit intentions [11–13], with scant attention paid to the role of psychographic characteristics and their effect on the overall image of eco-friendly hotels held by customers, especially the contributions of cognitive and affective images [14,15]. The term cognitive image describes a guest's beliefs and knowledge about destinations or service providers. In contrast, the term affective image refers to a customer's feelings and emotional responses about different features of a destination or the services provided [16]. Thus, we sought to investigate the effect of consumers' environmental values and "low-carbon knowledge" (i.e., the understanding of the causes and consequences of carbon dioxide emissions and following specific actions to minimize the impact on the environment [17]) on their overall image and its subsequent impact on their behavior. More specifically, providing a novel contribution to the tourism and hospitality literature, we propose an integrative model that (1) measures environmental values, low-carbon knowledge, and their effect on green hotel customers' overall images of green hotels through affective and cognitive images, and (2) measures the impact of overall image on behavioral intentions, including promotion by word of mouth, willingness to pay a premium for a green hotel, and revisit intentions, in the Sultanate of Oman. The conceptual framework and hypotheses are shown in Figure 1.

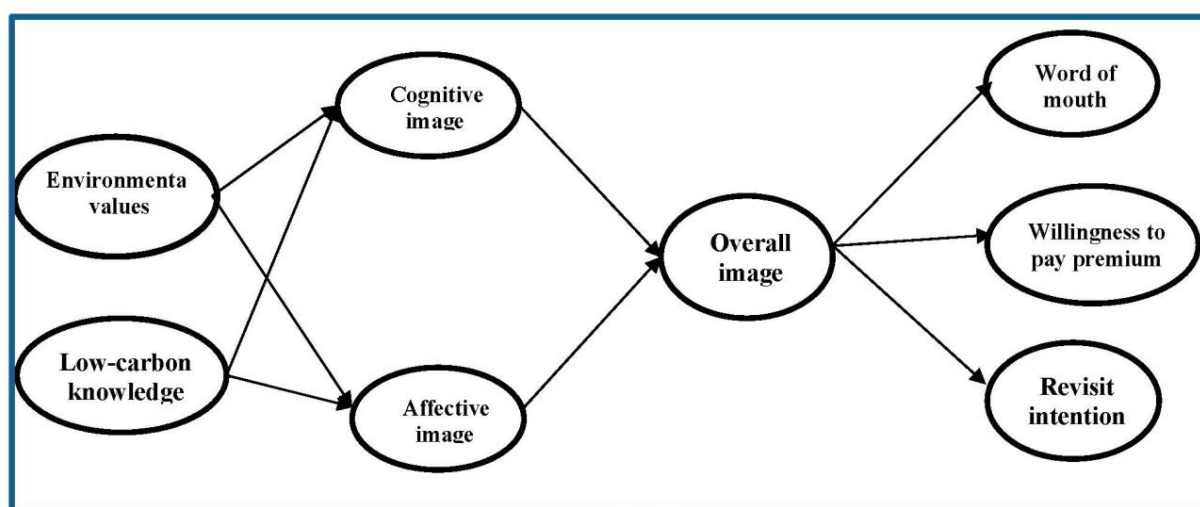


Figure 1. Conceptual Framework.

## 2. Background, Conceptual Framework and Hypotheses

To further promote the tourism industry in Oman, the government has initiated an ambitious strategy named Oman 2040 vision, in which tourism is a key area of development [18]. Tourism has always been regarded as one of Oman's most important sectors in terms of economic, environmental, and sociocultural development [19,20]. The strategy is projecting 11.7 million tourists (both domestic and international) by 2040. Furthermore, the strategy aims to attract tourism-related investment worth 20 billion Omani Rials (OMR) mainly from the private sector, creating around 535,000 direct and indirect job opportunities [18]. In relation to accommodation, the strategy targets a total of 80,000 rooms in different accommodations facilities, i.e., hotels, vacation homes, and integrated tourism complex. Around 50 entities from the private sector and 30 entities from the public sectors are to be involved in the implementation of the mentioned strategy [18].

### 2.1. Environmental Values

Recently, environmental values have been recognized as playing a crucial role in public and individual decisions. Environmental values are defined as the beliefs of individuals and communities about the well-being of the natural environment and the necessity of learning how to treat the natural world [21]. Accordingly, most environmental values are personal values [22]. These personal values are seen in an individual's attitudes and behavior, as they are affected indirectly through environmental self-identity and personal norms [23]. Many researchers have identified and studied two types of individual values, ecocentric and anthropocentric, to measure environmental attitudes. Both cognitive and affective values are based on human concern for preserving natural resources [24,25], but ecocentric values are concerned with preserving natural resources for the sake of providing humans with a better quality of life, whereas anthropocentric values are concerned with preserving natural resources in order to provide humans with a better quality of life [13].

Moreover, environmental values are correlated with perceived value, in that consumers evaluate the product/services they receive, while considering the price they pay [13]. Hospitality and tourism studies have referred to perceived value as the value for money [26]. In addition, environmental values are significantly connected to emotional and social values [27]. Hence, green hotel customers tend to evaluate hotels according to emotional, social, and perceived values. Since many studies have proven that green hotels fulfill and satisfy green customers' needs [28], the current study explores how environmental values can affect cognitive and affective images. Additionally, we investigate whether the overall image impacts revisit intention. Overall, Ref. [29] claimed that it is reasonable to believe that the impression of a nature-based environment value will influence customers' cognitive and emotive images. It is in line with [30] who believe that cognitive and affective images have a favorable impact on customer satisfaction. Based on these considerations, we developed two main hypotheses:

**Hypothesis 1 (H1).** *Environmental values significantly affect cognitive images.*

**Hypothesis 2 (H2).** *Environmental values significantly affect affective images.*

### 2.2. Low-Carbon Knowledge

Low-carbon knowledge is described as knowledge that includes an understanding of the meaning and sources of low-carbon energy [31]. Carbon dioxide has become one of the main threats to the environment and the human system [32]. According to [33], carbon dioxide rose by 2.6 parts per million (ppm) during 2020, reaching 412.5 ppm. The tourism industry contributes 8% of the world's greenhouse gas emissions [34]. Within that industry, the lodging sector consumes a substantial amount of energy, water, food, and paper and produces a considerable amount of carbon dioxide [35]. To reduce the negative impact of the industry on the environment, hotel management recently began to follow environmentally friendly practices and "go green" [36], and awareness of the issue continues to increase [37].

Consumers' low-carbon knowledge can affect both cognitive and affective images and can increase their intention to revisit green hotels. Previous studies have pointed out the impact of low-carbon knowledge on behavioral intentions [38]. Customers consciously adopted environmentally friendly behavior if they had a basic knowledge about environmental issues and problems [39].

Moreover, low-carbon knowledge is crucial for building a low-carbon economy [40]. Green hotels have used their low-carbon knowledge to increase their guests' awareness of environmental issues [13]. Many studies have shown the influence of environmental knowledge on guests' positive attitude [16,41]. This positive attitude could create an image that would lead customers to favor revisiting a particular hotel depending on the hotel's environmental practices. This led us to formulate our next two main hypotheses:

**Hypothesis 3 (H3).** *Low-carbon knowledge significantly affects cognitive images.*

**Hypothesis 4 (H4).** *Low-carbon knowledge significantly affects affective images.*

### 2.3. Cognitive and Affective Images

The image concept has received increasing attention in academia and the tourism industry as image plays a crucial role in shaping customers' decision making [42]. A cognitive image represents an individual's beliefs, feelings, and overall impression of a specific destination [16,43]. To be more precise, the cognitive image represents a tourist's knowledge and beliefs about a location, whereas the affective image represents their feelings or emotional responses to it [44]. This can be applied to a customer's perceptions and opinions about eco-hotels, as well as the measures taken by hotels to safeguard the environment. According to research, customers' perceptions of hotels have a substantial impact on their satisfaction [45,46], and customers tend to revisit and recommend a specific destination or hotel depending on this overall image [47]. Cognitive and affective images, described above, are subcategories of this overall image [47]. Their interaction creates a positive or negative impression about a hotel and influences customers' evaluation of the establishment [48]. Moreover, in a study conducted by [49], perceived green image and green hotel practices significantly and positively affected the cognitive and affective image and consequently increased brand loyalty, which most likely increased guests' intention to revisit. However, Ref. [50] found that cognitive images more strongly impacted guests' overall image compared to affective images, yet in contrast, Ref. [51] found that the feelings associated with affective images were more influential. In the context of the lodging sector, eco-friendly hotels seek to gain a competitive advantage by enhancing people's overall image through their cognitive or affective images. We investigate whether cognitive or affective images have the most impact on the overall image. Two hypotheses were proposed:

**Hypothesis 5 (H5).** *Cognitive images significantly affect the overall image.*

**Hypothesis 6 (H6).** *Affective images significantly affect the overall image.*

### 2.4. Word of Mouth

Word of mouth (WOM) has become a dominant force in tourism. The lodging sector is interested in testing and measuring the power of WOM as one of the main tools they can use to promote their products and services [52]. WOM is a well-established concept in the tourism and hospitality literature, with significant theoretical and practical development [53,54]. It is defined as a customer's informal and direct communication with other customers, letting them know about the characteristics of and their personal experience with a particular product or service [55]. WOM reports can be positive or negative; whereas positive messages can boost a business's reputation, a negative statement can risk a business's future [56]. The services sector is affected by WOM owing to its intangible nature. Recently, WOM has played a significant role, with the growth of online sites and an increasing number of social media users serving them by checking facts and posting reviews (so-called electronic WOM) [57]. Although many tourism studies have shown the effects of WOM on customer decisions and retention, there is no empirical evidence regarding the role of WOM in encouraging customers to stay in eco-hotels. Based on [58], the overall image (affective and cognitive) has positive effects on customer word of mouth and visiting intention. This means that, if there is an effective and cognitive adequate image in green hotels, customers would recommend the green hotels as well. In other words, [58] showed that affective and cognitive images significantly affect WOM. Still, there is a debate regarding how the overall image could contribute to the customer's opinion and consequently affect their WOM messages. Accordingly, the following hypothesis was formulated:

**Hypothesis 7 (H7).** *Overall image positively and significantly influences word of mouth.*

### 2.5. Revisit Intentions and the Willingness to Pay a Premium

To raise revenues and grow customers' desire to return, the hotel industry has increased its efforts to improve the quality of its services and achieve customer happiness [59]. Green customers tend to visit, pay extra for, revisit, and recommend eco-friendly hotels [60,61]. Additionally, green customers who had a positive overall image of eco-friendly hotels were most likely willing to pay a premium for staying in them and had the intention to revisit [62]. Moreover, it has been proven that the quality of implementing environmentally friendly measures has an impact on customer revisit intentions [63]. Hence, we articulated two further hypotheses:

**Hypothesis 8 (H8).** *A positive customer overall image of eco-hotels significantly affects willingness to pay a premium.*

**Hypothesis 9 (H9).** *The customer overall image significantly affects green customers' intention to revisit.*

## 3. Methods

### 3.1. Population Setting and Data Collection

Between November and December 2021, paper-based surveys were delivered with the help of two researchers to reach consumers at 54 four- and five-star hotels that were eco-certified and committed to sustainability in the Sultanate of Oman. The sample was recruited with nonprobability convenience sampling. Although this method impairs generalizability, it is the standard in tourism research because of the difficulty engaging specific tourism customers (e.g., customers who target eco-friendly hotels) and is widely used in the tourism and hospitality literature [64–66]. In total, 540 surveys were distributed, of which 342 were returned. Of these, 323 were usable and only 9 were deemed invalid. This specific type of customer was targeted because we sought to investigate customers' views of eco-friendly hotels by determining the overall image of green hotels in Oman. To ensure the quality of the collected data, the following tests were performed. First, Refs. [67,68] extrapolation procedure was used to assess nonresponses, which confirmed that no potential nonresponse bias existed. Second, Harman's one-factor test [69,70] test confirmed that common method bias was unlikely to have been an issue for this investigation. Third, in a pilot study with 50 questionnaire forms, the reliability and validity of constructs were assessed; all results exceeded the threshold values, such as 0.7 for reliability [71].

For data analysis, partial least squares structural equation modeling (PLS-SEM) was employed. In addition, a fuzzy-set qualitative comparative analysis (fsQCA) was used to test our hypotheses. This novel method is increasingly being used in social science research owing to its ability to determine the cumulative effect of various elements that influence the final result [64,72,73]. The respondents were mostly between the ages of 25 and 40 years (48.2%), and the smallest proportion consisted of those under 25 years (12.3%). The majority of customers held a university degree (82.4%). The gender ratio of the sample was 58.7% men to 41.3% women.

### 3.2. Measures

Eight key latent variables that were verified in earlier studies were employed in this investigation. The items in the questionnaire were graded on a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). These latent variables were environmental values, low-carbon knowledge, cognitive image, affective image, overall image, WOM, willingness to pay a premium, and revisit intention. Environmental values, affective image, overall image, WOM, willingness to pay a premium, and revisit intention were measured using items developed by [47] based on a variety of prior sources. The low-carbon knowledge of



participants was measured with the seven-item low-carbon literacy scale adopted from [13], which was originally developed by [74]. Appendix A has more information on these measurements.

### 3.3. Analysis

The study hypotheses were tested using a partial least square structural equation modeling (PLS-SEM) approach with WarpPLS 7.0 software [75]. Here, a variance-based approach was deemed more appropriate thanks to its higher explanatory power, compared to covariance-based SEM [76]. Following this, based on the assumption that the drivers of customers' overall image of eco-hotels are interlinked, a configuration analysis using fuzzy-set qualitative comparative analysis (fsQCA) technique was applied in an effort to capture the complexity underlying these relationships.

#### 3.3.1. PLS-SEM Analysis

The main purpose of the PLS-SEM was to assess the relationships between the latent variables of the study (also known as the structural/inner model). However, prior to this, the variables' reliability and validity needed to be examined to ensure good-quality measurement (also known as the measurement/outer model). It should be noted that the present study involved first-order reflective and second-order formative variables. The measurement quality of these two types of variables is examined in turn.

#### Measurement Model

In the case of first-order reflective variables, reliability, which captures the measures' consistency, was assessed through composite reliability and Cronbach's alpha. Validity, which reflects the extent to which a set of indicators mutually assess what they are expected to measure, is typically examined through item loadings and the average variance extracted (AVE; for convergent validity) and square roots of AVEs (for discriminant validity). Both reliability and validity were confirmed since scores for composite reliability and Cronbach's alpha met the 0.7 thresholds, and the values of the AVE were all higher than 0.5 [71]; see Table 1. In addition, the current study used the novel heterotrait-monotrait (HTMT) rate of associations to examine the latent variables' discriminant validity, as indicated by Kock [75], indicating that discriminant validity is acceptable when HTMT is less than 0.90. As a result, all of the current study's latent variables showed satisfactory discriminant validity (see Table 2). For discriminant validity, the [77] criterion was also met.

**Table 1.** Measurement Model of the First Order Reflective Variables.

Variable	CR	$\alpha$	AVE	VIF
ENV	0.883	0.839	0.559	2.504
LCK	0.903	0.875	0.572	2.565
CI	0.826	0.681	0.616	2.479
QA	0.893	0.863	0.512	2.933
AI	0.893	0.840	0.677	1.911
OI	0.920	0.870	0.794	2.341
WOM	0.877	0.789	0.704	1.924
WPP	0.872	0.779	0.695	3.059
RV	0.908	0.848	0.768	2.432

Note. AVE = average variance extracted; CR = composite reliability; VIF = variance inflation factor; ENV = environmental values; LCK = low-carbon knowledge; QA = quality characteristics; CI = cognitive image; AI = affective image; OI = overall image; WOM = word of mouth; WPP = willingness to pay a premium; RV = revisit intention.

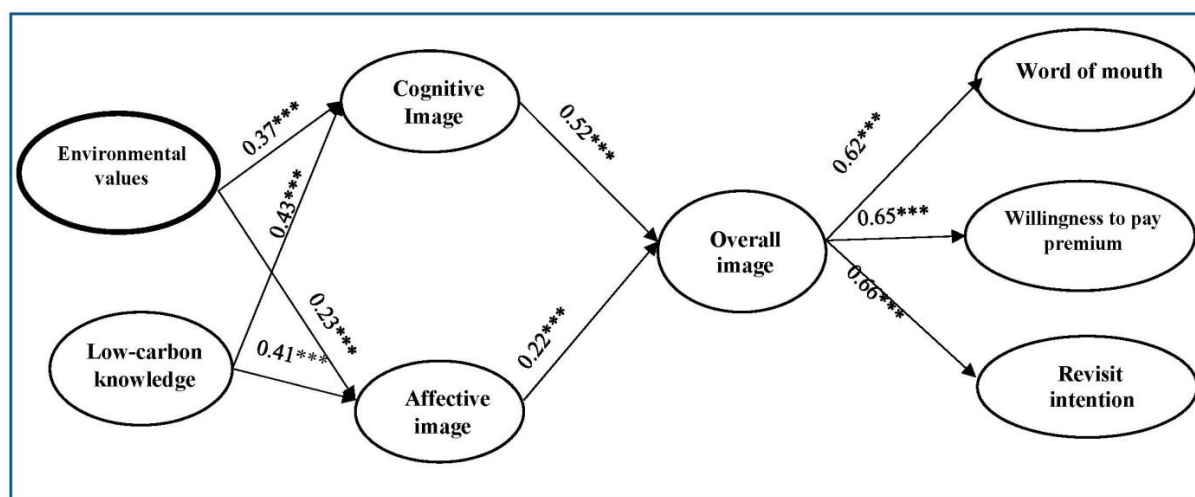
**Table 2.** The Heterotrait-monotrait (HTMT) rate of associations.

ENV	LCK	AI	OI	WOM	WPP	RV	CI
ENV							
LCK	0.814						
AI	0.601	0.610					
OI	0.648	0.685	0.647				
WOM	0.638	0.651	0.463	0.595			
WPP	0.744	0.723	0.708	0.776	0.823		
RV	0.653	0.661	0.601	0.774	0.674	0.853	
CI	0.814	0.817	0.786	0.784	0.742	0.919	0.778

The abovementioned criteria do not apply when formative latent variables are involved. Instead, validity is assessed through the significance of the indicators' weights and their variance inflation factors (VIFs) [78]. In this study, both had significant weights and VIF values less than 5, suggesting good validity. Moreover, multicollinearity issues can also arise, and these can be checked through the full VIFs. Table 1 shows that none of the constructs exceeded the cut-off value of 10 [79]. In addition, the model fit and quality indices for the current study is also provided (see Appendix B).

#### Structural Model

The relationships between latent variables are assessed through path coefficients ( $\beta$ ) and  $p$  values. Figure 2 depicts these results. As Figure 2 shows, all hypotheses were accepted. In short, environmental values and low-carbon knowledge both increased the cognitive and affective images, which in turn boosted the overall image of green hotels. Subsequently, the overall image increased WOM, willingness to pay a premium, and revisit intention. The full model explains 55.6% of the variance in customers' overall image of green hotels and 39%, 42.7%, and 44.4% of the variance in WOM, willingness to pay a premium, and revisit intention, respectively. Additionally, all indirect effects in this model were significant and positive. Hence, it can be concluded that cognitive image and affective image mediated the indirect influence of environmental values ( $\beta = 0.24$ ;  $p$  value  $< 0.001$ ) and low-carbon knowledge ( $\beta = 0.32$ ;  $p$  value  $< 0.001$ ) on customers' overall image. Likewise, it can be argued that overall image mediated the indirect influence of cognitive image on WOM ( $\beta = 0.32$ ;  $p$  value  $< 0.001$ ), willingness to pay a premium ( $\beta = 0.34$ ;  $p$  value  $< 0.001$ ), and revisit intention ( $\beta = 0.34$ ;  $p$  value  $< 0.001$ ) and the indirect influence of affective image on WOM ( $\beta = 0.14$ ;  $p$  value  $< 0.001$ ), willingness to pay a premium ( $\beta = 0.14$ ;  $p$  value  $< 0.001$ ), and revisit intention ( $\beta = 0.15$ ;  $p$  value  $< 0.001$ ).

**Figure 2.** The Structural Model. Note: The asterisks indicate that \*\*\* =  $p$  value  $< 0.001$ .

### 3.3.2. Configuration Analysis (fsQCA)

With the assumption that the drivers of customers' overall image of green hotels interact in their influencing role, a configuration analysis was applied to capture such complexity. This was undertaken using fsQCA, which was developed by [80]. Based on a Boolean algebra approach and by capturing contrarian cases that do not fit within the general trend of the data [81], fsQCA is able to identify multiple combinations leading to a given outcome [82]. The software used was fsQCA.3.0 [83].

#### Calibration

Prior to applying the configuration analysis, we calibrated the Likert-based variables. To perform this, we needed to identify three values in the Likert scores as representing non-membership (0), crossover (0.5), and full membership (10) [83]. The typical approach here would be to select the values 1 (*strongly disagree*), 3 (*neutral*), and 5 (*strongly agree*) or 2 (*disagree*), 3 (*neutral*), and 4 (*agree*) as thresholds. However, in this study, a method based on percentiles had to be followed owing to the high skewness of the data scores toward higher values. Specifically, the 5th, 50th, and 95th percentiles were chosen to correspond to non-membership, crossover, and full membership [72]. Table 3 shows the thresholds used.

**Table 3.** Percentiles Used as Thresholds in the Calibration Process.

Percentile	ENV	LCK	CI	AI	OI
5th	2.6	2.7	3	2.5	1.3
50th	4	4	4	4	4
95th	5	5	4.7	5	5

Note. ENV = environmental values; LCK = low-carbon knowledge; CI = cognitive image; AI = affective image; OI = overall image.

#### Necessity Analysis

Following the calibration step, a necessity analysis can be conducted to identify any condition that might be necessary to reach the sought outcome [84]. According to [85], for a condition to be necessary, it needs to exhibit a consistency score of 0.90 or above and a coverage exceeding 0.75. Table 4 depicts the results of our necessity analysis. None of the drivers of customers' overall image of green hotels was necessary.

**Table 4.** Necessity Analysis.

Condition	Consistency	Coverage
ENV	0.78	0.85
LCK	0.80	0.86
CI	0.77	0.86
AI	0.76	0.87

Note. ENV = environmental values; LCK = low-carbon knowledge; CI = cognitive image; AI = affective image.

#### Sufficiency Analysis

To capture the combinations of conditions affecting customers' overall image of green hotels, truth tables encompassing possible combinations were generated by the software [86]. Here, the number of those logically possible configurations is  $2^4 = 16$ . To filter the combinations worthy of investigation, frequency and consistency thresholds need to be set. The former is defined as the minimum cases a combination must have to be considered viable, whereas the latter is defined as the degree to which the cases sharing a given combination of conditions agree in displaying the outcome in question [86]. In this study, the frequency threshold was set at 5, as [86] advised choosing 5 or 10 when large samples are involved. This accounted for 86% of the data. As for the consistency threshold, we considered both the raw consistency (minimum of 0.75) and the proportional reduction in inconsistency (0.65), as per the suggestion of [87]. Table 5 shows the results. Alongside



consistency scores, coverage values are also provided. Here, coverage is defined as “the degree to which a cause or causal combination ‘accounts for’ instances of an outcome” [86] and is considered a measure of empirical importance of sufficient configurations [88]. It can be raw (accounting for overlap coverage) or unique (restricted to exclusive coverage). Moreover, core and complementary (peripheral) conditions can be identified, with core implying a strong association and peripheral reflecting a weaker link [89].

**Table 5.** Sufficiency Analysis.

Solution	ENV	LCK	CI	AI	Raw Coverage	Unique Coverage	Consistency
1	●	•	●		0.64	0.64	0.93

Note. ● = presence of a core condition; • = presence of a peripheral condition; Frequency cutoff: 5; consistency cutoff: 0.95. ENV = environmental values; LCK = low-carbon knowledge; CI = cognitive image; AI = affective image.

As Table 5 shows, it seems that only one combination emerged as a driver of consumers’ positive overall image of green hotels. This involves environmental values, low-carbon knowledge, and cognitive image, with low-carbon knowledge being a peripheral condition and cognitive image and environmental values being core. The affective image did not seem to play an important role since its presence does not affect the outcome.

To conclude, one may argue that customers’ positive overall image of green hotels is driven by the complex interactions of environmental values, low-carbon knowledge, and cognitive image rather than the isolated influence of each. More importantly, it seems that the presence of these three drivers together is likely to reduce the need for an affective image, contrary to what the PLS-SEM showed, where all four factors played an important role (although in the SEM, cognitive image had a stronger influence than affective image). However, the PLS-SEM has clarified the process whereby these factors affect customers’ overall image of green hotels, suggesting that environmental values and low-carbon knowledge shape cognitive image, which in turn drives a positive overall image.

#### 4. Discussion and Conclusions

The holistic approach adopted in this study, wherein two complementary techniques were applied to uncover the determinants of customers’ overall positive image of green hotels, has revealed unique findings that explain the complex process shaping customers’ perceived image. On the one hand, the fsQCA analysis shows that the overall positive image of green hotels is driven by the interaction of two core factors, namely, environmental values and cognitive image, along with one peripheral condition, low-carbon knowledge. Together, these factors are sufficient to form a favorable image of eco-hotels without the need for a favorable affective image. On the other hand, the SEM approach has clarified that this process takes place through an indirect mechanism wherein environmental values and low-carbon knowledge shape customers’ cognitive image, which then boosts the overall positive image of eco-hotels. Such comprehensive insights address the extant gap in the body of literature vis à vis the influence of customers’ psychological factors through cognitive and affective images [14,15]. These findings are discussed next.

Unlike [51] claiming that customers’ affective image is more likely to affect the overall image compared to the cognitive image, this study has shown that there is a complex interaction effect of environmental values (as a core condition) and low-carbon knowledge (as a peripheral condition) on cognitive image that reduces the need for an affective image. The authors of [60] explained that when it comes to staying in green hotels, customers typically compare the value of the product received against the price they pay. These prices are often superior and hence their cognitive image tends to improve. Here, green hotel customers base their choice on the perceived value with its social and emotional dimensions. According to [26], perceived value in this context is often linked to value for money. Furthermore, when the cognitive image is improved, customers’ overall image is likely to

improve [50]. As for the peripheral role of low-carbon knowledge, this is in line with the general premise that environmental knowledge encourages customers' favorable attitudes toward environmentally friendly entities [16,39]. There has been evidence suggesting that low-carbon knowledge impacts behavioral intentions [38]. However, it should be recalled that the influence of such knowledge is not sufficient and is contingent on the presence of both environmental values and the development of a cognitive image, as per the findings from the fsQCA analysis.

Turning to the impact of customers' overall positive image on WOM, willingness to pay a premium, and revisit intentions, the current findings from the SEM analysis echo previous studies. In fact, when positive, WOM can improve the reputation of a business [56]. Likewise, a favorable overall image and positive perceptions of quality are likely to encourage revisit intention and willingness to pay premium rates [63]. Customers' cognitive and affective images will be influenced by the idea of a nature-based environment value, which will improve their positive WOM and revisit intention. In other words, nature is significant because of what it may contribute to the enjoyment and well-being of hotel guests seeking relaxation and proximity to nature. In this vein, an eco-friendly hotel can genuinely play a part in saving the environment, and there are some of the ways to achieve it: (1) implement energy-saving technologies, (2) embrace recycling, (3) encourage visitors to be environmentally conscious, (4) begin composting, (5) conserve water, (6) plant a garden, (7) encourage the growth of local, sustainable businesses, and (8) make use of alternative energy sources [90]. A study by Merli [4] suggested that guests who experienced the stay in an eco-hotel are more likely to develop a specific loyalty toward the hotels that implement green practices.

To conclude, the holistic approach adopted in this study holds important theoretical and practical implications for hospitality managers of green hotels. Theoretically, the current paper adds fresh evidence from the largely overlooked Omani context on the role of psychological characteristics in shaping customers' overall image toward eco-friendly hotels, thus addressing prior calls in this regard [14,15]. More importantly, through a configuration approach, the present study uncovered complex interactions among these characteristics when influencing the overall image. When combined with other factors (environmental values and low-carbon knowledge), cognitive image was found to potentially reduce the need for an affective image. Hence, future researchers should consider interactions across cognitive and affective images when examining their influence on sustainability perceived image. Last, the mediating roles of cognitive, affective, and overall images add further evidence on the importance of perceived customers' image in bridging the link between personal characteristics (values and knowledge) and behavior (revisit intention, WOM, and willingness to pay a premium).

Practically, we recommend that particular attention be dedicated to developing a favorable image of eco-friendly hotels, as this would bridge the gap between personal characteristics and customer actions in terms of WOM, willingness to pay a premium, and revisit intention. In this regard, the managers of eco-friendly hotels are advised to focus particularly on maximizing customers' cognitive image in terms of the perceived value for money and quality attributes by ensuring good customer service and competitive offers. Customers seeking green hotels should not perceive green hotels as lower value for money than traditional hotels. To achieve this, the hotel managers of eco-friendly establishments should take full advantage of cost reduction benefits arising from green practices and transfer these to customers so that competitive deals can be offered. Additionally, it is also important to raise customers' awareness about environmental issues and the implications of low-carbon behavior in particular. This can be achieved through communication and awareness campaigns targeting both existing guests and potential customers. Advertising materials should stress the important role customers can play by supporting green establishments, and without losing value for money or the quality of service received. The perception that green hotels offer less competitive offers should be changed by fully exploiting the cost advantages of eco-friendly practices. In fact, the

current findings reveal that enhancing environmental values and knowledge, along with improving the perceived value for money and quality characteristics, will boost customers' overall image of eco-friendly hotels. Additionally, an enhanced image was found to boost revisit intention and attract more customers willing to pay a premium. Such benefits should also be used to design more competitive offers compared to traditional hotels.

Finally, a number of limitations need to be acknowledged. First, due to the cross-sectional nature of the data, any reference to causality needs to be taken with caution and was mainly made based on theory. Longitudinal studies should be carried out to confirm this causality, as they may be more effective in validating the framework's stability over time and identifying causal links among variables. Second, this study concentrated on behavioral intentions to explore how much an overall green image influences a guest's hotel choice. Although behavioral intentions have been commonly employed in the marketing and hospitality literature as an indication of attitudinal loyalty, this methodology does not match behavioral loyalty. Because behavioral loyalty is an important indicator that shows the number of times a guest may visit the same hotel in a certain category relative to the total number of stays in the category, this should be considered a research limitation. This limitation stems from actual green product sales revenues being lower than what consumers report, and the likelihood of customers paying a premium for green items being lower than one might expect [91]. Given the findings of this study, a future study should focus on actual behavioral metrics to thoroughly analyze the impact of green hotel options on consumer behavior. Such a study should look at the possible antecedents of behavioral loyalty to a green hotel. Third, because this study was conducted in Oman, more research is needed to see if the proposed model can be applied to participants in other countries. As a result, future studies should collect samples from a variety of countries to confirm the generalizability of this study methodology. Future research can use the paradigm of this study to conduct a cross-national analysis to discover if people from different countries provide different outcomes. Finally, the study reveals the drivers of customers' overall good perceptions of green hotels, which can influence behavioral intentions, without taking into account other factors that may influence these types of behavioral intentions. Customers' intentions to stay in a green hotel may be influenced by factors, such as the duration of stay and the purpose of the trip. As a result, future research should look at other possible influencing factors that have a direct effect on customers' intentions to stay in green hotels. Future research could look at the moderating effects of these influencing variables on the links between the study's independent and dependent variables.

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## Appendix A

### Measures of the study

Please circle one choice for each of the following statements (1 = strongly disagree . . . 5 = strongly agree).

		Strongly Disagree 1	Disagree 2	Neither Agree nor Disagree 3	Agree 4	Strongly Agree 5
Environmental value						
ENV1	It makes me sad to see natural environments destroyed	1	2	3	4	5
ENV2	Nature is valuable for its own sake	1	2	3	4	5
ENV3	One of the most important reasons to conserve is to preserve wild areas	1	2	3	4	5
ENV4	Nature is important because of what it can contribute to the pleasure and welfare of humans	1	2	3	4	5
ENV5	We need to preserve resources to maintain a high quality of life	1	2	3	4	5
ENV6	One of the most important reasons to conserve is to ensure a continued high standard of living	1	2	3	4	5
Low-carbon knowledge						
LCK1	I have knowledge about global warming (such as the greenhouse effect)	1	2	3	4	5
LCK2	I have knowledge about green architecture (in restaurants, hotels, tourist destinations, and premises)	1	2	3	4	5
LCK3	I have knowledge of green consumption (consuming produce that is grown locally or is in season)	1	2	3	4	5
LCK4	I understand the interdependence of human beings and the ecosystem	1	2	3	4	5
LCK5	I understand how much the tourism industry depends on the natural environment and the resources in it	1	2	3	4	5
LCK6	I understand the balance between livelihood and the need to conserve the natural environment	1	2	3	4	5
LCK7	I understand how tourism activities influence the biodiversity and the population of species in a region	1	2	3	4	5
Value (VA)—Cognitive image						
VA 1	a green hotel offers good value for money	1	2	3	4	5
VA 2	The price charged by green hotels is reasonable	1	2	3	4	5
VA 3	a green hotel offers good quality/benefits	1	2	3	4	5

		Strongly Disagree 1	Disagree 2	Neither Agree nor Disagree 3	Agree 4	Strongly Agree 5
Quality attributes (QA)—Cognitive image						
QA1	a green hotel has hygienic and attractive dining areas	1	2	3	4	5
QA2	Restaurant(s) in a green hotel offers fresh and healthful food	1	2	3	4	5
QA3	a green hotel offers healthy amenities and products	1	2	3	4	5
QA4	a green hotel offers healthy “green” guest bedrooms	1	2	3	4	5
QA5	Staying at a green hotel is safe	1	2	3	4	5
QA6	Services at a green hotel meet my needs and expectations	1	2	3	4	5
QA7	The facilities and atmosphere of a green hotel are preferable					
QA8	Overall, the rooms and accommodations at a green hotel are clean and comfortable.					
Affective image (AI) Staying at a green hotel will be						
AI1	Arousing/sleepy	1	2	3	4	5
AI2	Pleasant/unpleasant	1	2	3	4	5
AI3	Exciting/gloomy	1	2	3	4	5
AI4	Relaxing/distressing	1	2	3	4	5
Overall image (OI) Very negative (1)/ very positive (5)						
OI1	The overall image of staying in green hotels is ...	1	2	3	4	5
OI2	The overall image I have regarding green hotels is ...	1	2	3	4	5
OI3	The overall, I consider that green hotels have a favorable image such that I would consider staying there	1	2	3	4	5
Word-of-mouth (WOM)						
WOM1	I encourage my friends and relatives to stay at a green hotel when travelling	1	2	3	4	5
WOM2	If someone is looking for good hotel dining facilities, I generally advise him/her to stay at a green hotel	1	2	3	4	5
WOM3	I say positive things about an environmentally friendly hotel	1	2	3	4	5
Willingness to pay a premium (WPP)						
WPP1	It is acceptable to pay a premium to stay at a hotel that engages in green practices	1	2	3	4	5
WPP2	I am willing to pay more to stay at a green hotel	1	2	3	4	5
WPP3	I am willing to spend extra in order to stay at an environmentally friendly hotel	1	2	3	4	5



		Strongly Disagree 1	Disagree 2	Neither Agree nor Disagree 3	Agree 4	Strongly Agree 5
Revisit intention (RVI)						
RVI1	I am willing to stay at a green hotel when travelling	1	2	3	4	5
RVI2	I plan to stay at a green hotel when travelling	1	2	3	4	5
RVI3	I will make an effort to stay at a green hotel when travelling	1	2	3	4	5

### Any other suggestions, please add

.....  
 .....  
 .....  
 .....

## Appendix B

### Model fit and quality indices

Average path coefficient (APC) = 0.462,  $p < 0.001$

Average R-squared (ARS) = 0.444,  $p < 0.001$

Average adjusted R-squared (AARS) = 0.442,  $p < 0.001$

Average block VIF (AVIF) = 1.895, acceptable if  $\leq 5$ , ideally  $\leq 3.3$

Average full collinearity VIF (AFVIF) = 2.483, acceptable if  $\leq 5$ , ideally  $\leq 3.3$

Tenenhaus GoF (GoF) = 0.558, small  $\geq 0.1$ , medium  $\geq 0.25$ , large  $\geq 0.36$

Simpson's paradox ratio (SPR) = 1.000, acceptable if  $\geq 0.7$ , ideally = 1

R-squared contribution ratio (RSCR) = 1.000, acceptable if  $\geq 0.9$ , ideally = 1

Statistical suppression ratio (SSR) = 1.000, acceptable if  $\geq 0.7$

Nonlinear bivariate causality direction ratio (NLBCDR) = 1.000, acceptable if  $\geq 0.7$

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