



**BRIDGING AWARENESS AND BOOKING BEHAVIOUR:
A CRITICAL ANALYSIS OF SUSTAINABILITY AND
ENVIRONMENTAL CERTIFICATIONS IN ITALIAN TOURISM**

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Abstract

Purpose. This study aims to explore the influence of green certifications and eco-friendly practices on holiday decisions among Italian tourists, examining whether these environmental credentials genuinely impact travel choices in the increasingly sustainability-conscious tourism sector.

Design/methodology/approach. The methodology employed consisted of structured quantitative survey instruments administered to over 300 Italian respondents. Analysis included descriptive and inferential statistics, structural equation modelling (SEM) to investigate underlying causal relationships, and cluster analysis to identify distinct consumer segments.

Findings. The results of the study demonstrate the pivotal function of tourism and services in the economic development of peripheral regions. There is a notable interest among young people in the advancement of these areas. Nevertheless, the analysis reveals critical concerns pertaining to mobility, inadequate infrastructure, and a paucity of cultural events and networking prospects. The aspiration to reside in these areas is frequently impeded by the perception of limited employment and business prospects.

Practical and Social implications. The findings highlight a significant gap between the respondents' support for eco-friendly practices and booking behaviours. Despite broad sustainability awareness, several travellers lack a clear understanding of environmental certifications. Tourism businesses need to enhance communication about their environmental initiatives, and regulatory bodies should reassess their strategies for promoting sustainable tourism. Effective consumer education and clear communication of the benefits of sustainability certifications are pivotal.

Originality of the study. This research breaks new ground by examining the dual facets of awareness levels and the influence of sustainability certifications on holiday choices. It identifies critical areas for improvement, such as better consumer education, streamlined certification communication, and targeted engagement strategies, providing valuable insights for hospitality businesses to leverage sustainability as a competitive advantage.

1. Introduction

Sustainability stands among the foremost societal concerns of our time, impacting a multitude of industries and imposing substantial challenges to the prospects of future generations. In particular, the phenomenon of climate change has been recognised as one of the most pressing global environmental threats, significantly disturbing ecosystems, threatening biodiversity, and undermining socio-economic stability worldwide (IPCC, 2022). Notably, tourism, being one of the fastest-growing global industries, represents both a contributor to and a casualty of these climatic alterations (Font & McCabe, 2017). As a primary socioeconomic pillar for many countries, tourism impacts not only national and local economies but also local environmental quality, cultural heritage, and community well-being (Page & Duignan, 2023). Hence, rethinking tourism models with a sharper alignment to sustainability has become urgently necessary for industry stakeholders and academicians alike (Hall et al., 2013).

The increasing recognition of tourism's role, both positively as a driver of sustainable development and negatively as a source of environmental degradation, has led to sustained academic and practical discourse around the concept of sustainable tourism (Butler, 2018). According to the World Tourism Organisation (UNWTO), sustainable tourism involves practices that respond suitably to current economic, social, and environmental imperatives without sacrificing opportunities for future generations (Canton, 2021). This conception emphasises economic efficiency, responsible ecological management, and the central importance placed on social equity and cultural sensitivity across the tourist experience (Ryan, 2002). Despite broad agreement on the importance of sustainable principles, a persistent gap has been identified in translating widespread theoretical understanding and conceptual awareness into actionable consumer behaviours in the tourism sector (Font & McCabe, 2017).

In pursuit of bridging this gap between consumer awareness and behaviour, environmental certifications and eco-friendly labels have become increasingly prevalent within the hospitality sector as practical tools communicating sustainability commitments (Lesar et al., 2023). Environmental certifications represent authoritative criteria frameworks designed to evaluate and promote sustainable practices within tourism operations, hospitality services, and travel destinations (Franz & Cruz, 2024). The implementation of these certifications, such as ISO 21401:2019 and EU Ecolabel, provides businesses with guidance on sustainability practices, fosters operational transparency, and assures consumers of verified eco-friendly services (Pratt & Zivrali, 2024). However, several challenges constrain the utility and effectiveness of tourism sustainability certifications. Among these, market confusion due to certification proliferation, limited consum-

er knowledge, perceptions of greenwashing, and ineffective communication strategies have been found to reduce the transformative potential of sustainability standards (Elhoushy et al., 2025; Escoto et al., 2022).

While the existing literature extensively documents the conceptual importance of sustainable tourism (Gössling & Hall, 2019) and recognises the valuable role of certification schemes (Chrysiopoulos et al., 2024), investigations remain limited regarding how individual tourists respond to and utilise these certifications in practice, particularly within the context of the Italian tourism market. This gap in the literature reflects a call for further research into actual consumer awareness levels, their perceptions of certifications, and the direct influence these factors exhibit in their accommodation booking decisions and travel behaviours.

Thus, this research aims to narrow the identified gap by critically analysing how environmental certifications impact Italian tourists' awareness and effective booking behaviours. Specifically, the purpose is to investigate the actual level of consumer understanding regarding sustainability certifications, explore how hospitality businesses can better communicate these credentials, and identify strategies to increase consumer engagement with certified accommodations. To achieve these goals, the current study sets out the following research questions:

RQ1. What is the level of awareness and understanding among travellers regarding sustainability certifications in the hospitality industry?

RQ2. How can hospitality businesses effectively communicate the benefits of sustainability certifications to potential guests?

RQ3. What marketing strategies can increase consumer engagement with and preference for sustainability-certified accommodations?

The manuscript is structured as follows: after the introduction, the next section provides an in-depth literature review that identifies existing research, critically discusses the role and evolution of sustainability certification practices in tourism, and highlights persisting challenges. Subsequent sections describe the methodological approach of empirical research, the findings of the study, and the discussion regarding the theoretical and practical implications. Finally, the manuscript concludes by summarising key insights, acknowledging the present limitations, and suggesting future research directions.

2. Literature review

2.1 *The Evolution and Impact of Sustainability Certifications*

The tourism and hospitality industry has evolved remarkably in its sustainable practices since the early 1990s. This transformation stems from heightened environmental consciousness among business guests, who expect businesses to take concrete action on environmental and social issues. As the industry adapts to these expectations, sustainability certifications have emerged as vital tools that establish and validate environmental standards across hospitality businesses (Lesar et al., 2023).

The inception of sustainability certification in tourism dates to the early 1990s, beginning with voluntary environmental certification programs (Valenciano-Salazar et al., 2022). Font and Buckley (2001) noted that the field evolved from basic eco-labels to complex integrated systems (Nakashii & Chapman, 2024). Establishing the Global Sustainable Tourism Criteria (GSTC) in 2008 marked a pivotal development, creating the first worldwide framework for sustainable tourism standards (Franz & Cruz, 2024).

The current certification landscape encompasses various frameworks operating at different levels (Chrysikopoulos et al., 2024). The ISO certification framework has notably influenced the hospitality sector through two primary standards: ISO 14001:2015 Environmental Management System and ISO 21401:2019 Tourism and Related Services - Sustainability Management System for Accommodation Establishments (Firoiu et al., 2019). Research by Testa et al. (2014) indicates significant environmental improvements through the implementation of ISO 14001:2015. More recent studies by de Paula et al. (2021) demonstrate that ISO 21401:2019 provides a thorough framework explicitly designed for accommodation establishments. Their findings reveal that properties adhering to ISO 21401:2019 perform better across environmental, social, and economic sustainability aspects. Furthermore, Goubran (2019) highlights that this standard helps properties align with the UN Sustainable Development Goals, with certified properties typically reducing energy and waste.

Another relevant certification for the tourism sector is the European Union's Eco-Management and Audit Scheme (EMAS). Established by the European Commission in 1993, it can be applied to a wide range of industries and sectors (García-Álvarez & de Junguitu, 2023), and it has been the subject of various studies (Ociepa-Kubicka et al., 2021; Murmura et al., 2021; García-Álvarez & de Junguitu, 2023) that highlighted the positive impact of this certification in promoting sustainability practices (García-Álvarez & de Junguitu, 2023).

Challenges and Future Directions in Sustainability Certifications

The GSTC has established itself as the global reference point for sustain-

able tourism certification. Its criteria for destinations and industries form the foundation for numerous certification schemes. Elhoushy et al. (2025) argue that this standardisation has advanced sustainable practices across the sector.

Regional certification programs have also emerged, such as the EU Ecolabel for tourist accommodation services, the Nordic Swan Ecolabel, and Travelife certification (Rodríguez-García et al., 2023). These regional schemes often incorporate local considerations while maintaining consistency with global standards (Iodice et al., 2025).

The financial benefits of sustainability certification are well-documented. Additionally, Martínez García de Leaniz et al. (2018) found that environmentally conscious travellers are 30% more likely to choose certified properties.

However, several obstacles persist. Small and medium-sized enterprises often face substantial costs in implementing and maintaining certification standards (Escoto et al., 2022). The proliferation of certification schemes has also led to market confusion and potential dilution of standards (Bennett, 2022).

The field continues to evolve with technological advancements and changing market requirements. Fakir & Baydeniz (2024) suggest that blockchain technology could revolutionise the verification and monitoring of sustainability certifications, enabling immediate tracking and improved transparency.

There is also increasing coordination between certification schemes and the UN Sustainable Development Goals (SDGs) (Ikram et al., 2021). This alignment promotes greater standardisation and comparability across frameworks despite the complexity of measuring and verifying impacts (Srivastava, 2024).

This examination reveals the multifaceted nature of sustainability certification in tourism and hospitality (Koseoglu et al., 2021). While certification offers significant advantages, questions about standardisation, accessibility, and impact measurement remain. The evolution of digital technologies and emerging global sustainability frameworks promises to transform certification systems into more refined and holistic tools (Feroz et al., 2021). The key to their effectiveness is balancing rigorous standards with practical implementation, thereby enabling meaningful certification across the diverse landscape of tourism and hospitality businesses (Khater et al., 2024).

3. Methodology

3.1 Research Aims

This study investigates how eco-friendly practices and environmental certifications influence consumer choices in Italy's hospitality sector. Specifically, it explores whether awareness and credibility of sustainability certifications affect booking preferences and loyalty among Italian travellers. Data were collected through a structured questionnaire distributed between September and December 2024. The research followed a three-phase process: instrument design, data collection, and statistical analysis (Taherdoost, 2021).

3.2 Instrument Design

A structured questionnaire was developed following an extensive review of the literature on sustainable tourism, green marketing, and consumer behaviour (Tasci et al., 2021). The instrument consisted of four main sections: (i) Demographics and travel habits, (ii) awareness of sustainability certifications, (iii) perceived sustainable practices, and (iv) willingness to pay a premium for certified accommodations.

Question types included dichotomous, multiple-choice, and five-point Likert-scale items. A pre-test with 20 participants assessed clarity, logic, and content validity. Revisions were made to improve question flow and remove ambiguities.

Three psychometric scales were developed and tested for reliability:

- Awareness of sustainability certifications (5 items): Cronbach's $\alpha = 0.84$
- Perception of sustainable practices (6 items): $\alpha = 0.81$
- Willingness to pay a premium (4 items): $\alpha = 0.83$
- Each scale demonstrated strong internal consistency and conceptual coherence.

3.3 Data Collection

The questionnaire was administered online over six weeks via social media and mailing lists. A convenience sampling method targeted adult Italian travellers who had taken at least one leisure or business trip in the past two years. A total of 311 valid responses were collected.

3.4 Data Analysis Strategy

Data were analysed using the statistical software JASP and the Lavaan package for SEM in R. The analytical strategy included descriptive statistics, regression analysis, Structural Equation Modelling (SEM), and cluster analysis.

3.4.1 Descriptive and Inferential Statistics

Descriptive statistics (means, standard deviations, and frequencies) were used to summarise demographic variables and sustainability attitudes. Inferential analyses included chi-square tests and Pearson's correlation to explore associations between variables.

3.4.2 Regression Analysis and Structural Equation Modelling (SEM)

A multiple linear regression model was used to identify predictors of prioritisation of certified accommodations, measured on a five-point Likert scale. Independent variables included: (i) age, gender, and education level, (ii) how frequently the respondent travelled, (iii) whether the respondents engaged in sustainable actions, (iv) the respondents' awareness and perception of certification credibility, and (v) the respondents' exposure to sustainability-related information during travel planning.

To test mediation effects, a Covariance-Based Structural Equation Modelling (CB-SEM) approach was used. The SEM model included three latent constructs:

- Hotel Sustainability Efforts: perceived environmental performance and sustainability education.
- Certification Credibility: transparency, trustworthiness, and perceived authority of certification schemes.
- Consumer Loyalty: likelihood of repeat bookings and positive word-of-mouth based on certification.
- Model fit was assessed using standard indices:
- Comparative Fit Index (CFI) ≥ 0.95 .
- Tucker-Lewis Index (TLI) ≥ 0.94 .
- Root Mean Square Error of Approximation (RMSEA) ≤ 0.05 .
- Standardised Root Mean Square Residual (SRMR) ≤ 0.08 .
- Indirect and direct effects were evaluated, and all path coefficients were tested for statistical significance.

3.4.3 Cluster Analysis

A K-means clustering technique was employed to segment consumers based on their sustainability awareness, behavioural patterns, and certification preferences. Before clustering, all relevant variables (measured on

Likert scales) were standardised as z-scores to ensure comparability.

To determine the optimal number of clusters, the Elbow Method was used by plotting the within-cluster sum of squares (WCSS) across 2–10 cluster solutions. The analysis indicated an optimal four-cluster model. The clustering results were later interpreted and validated in relation to the regression and SEM findings.

4. Findings

4.1 Respondents' Attitudes and Behaviour Towards Sustainability

The statistical analysis of respondents' socio-demographic and travel characteristics provides critical insights into sustainability preferences in the hospitality sector. Table 1 presents a comprehensive demographic profile of the sample (N = 311).

Table 1: Demographic profile of the Sample (N=311)

Characteristic	Frequency (n)	Percentage (%)
Age Group		
12-27	103	32.2
28-39	83	26.5
40-55	73	23.3
56+	52	16.9
Gender		
Male	168	53.7
Female	141	45.7
Non-binary / Prefer not to say	2	0.6
Education		
Primary school certificate	3	1
Lower secondary school diploma	22	7
High school diploma	120	39
Bachelor's degree	98	31.30
Master's degree / single-cycle degree	49	15.70
Master's degree / PhD	19	6.10
Occupation		
Student	45	14.5
Employed	190	61.1
Self-employed	30	9.6
Unemployed	31	10.0
Retired	15	4.8

Source: Authors' elaboration.

Respondents reported an average of 2.64 trips per year (SD = 2.06), reflecting considerable variation in travel frequency. Leisure travel was more prevalent (M = 3.50, SD = 1.05) than business travel (M = 2.10, SD = 1.15), and the overall travel frequency averaged 3.30 (SD = 1.00). The mean value for travel companions (M = 2.80, SD = 0.95) indicated a moderate tendency toward group travel. (Refer to Table 2.)

Table 2: Summary of Travel-Related Characteristics (N=311)

Travel-Related Characteristic	Mean	Standard Deviation
Average number of trips per year	2.64	2.06
Frequency of business travel (Likert scale)	2.10	1.15
Frequency of leisure travel (Likert scale)	3.50	1.05
General travel frequency (Likert scale)	3.30	1.00
Travel companion (coded response)	2.80	0.95

Source: Authors' elaboration.

Table 3 summarises respondents' self-reported engagement in sustainable behaviours. The highest mean score was for turning off lights (M = 4.1), followed by waste segregation (M = 3.8) and towel reuse (M = 3.7), indicating a generally moderate-to-high environmental consciousness while travelling.

Table 3 - Sustainable travel behaviour

Sustainable Behaviour	Mean Score (1-5 Scale)	Standard Deviation
Public Transport Usage	3.4	1.13
Towel Reuse	3.7	1.02
Turning Off Lights	4.1	0.85
Local and Organic Product Consumption	3.6	1.07
Waste Segregation	3.8	0.95

Source: Authors' elaboration.

Table 4 details consumer expectations from certified accommodations. The most highly rated attribute was a lower environmental impact (M = 4.14), followed by sustainability education and awareness (M = 3.88). These findings suggest that while eco-credentials are essential, communication of such efforts also plays a vital role in shaping consumer preferences.

Table 4: Consumers' Expectations from Certified Accommodation

Expectation	Mean Rating (1-5 Scale)	Standard Deviation	Notes
Lower Environmental Impact	4.14	0.87	Highest rating, critical eco-friendly practices
Education and Awareness	3.88	0.92	Important for clear communication
Social Responsibility	3.73	1.03	Moderate-high value on accountability
Enhanced Services and Comfort	3.22	1.10	Valued but secondary compared to sustainability

Source: Authors' elaboration.

Overall, the data indicate that consumers value both the substance (actual practices) and the communication (certification, education) of sustainability. This dual emphasis underpins the statistical models tested in subsequent sections.

4.2 Regression Analysis Results

To identify key predictors of prioritisation of certified accommodations, a multiple linear regression analysis was conducted. The model explained a substantial portion of the variance (adjusted $R^2 = 0.41$, $F = 27.8$, $p < 0.001$). The most influential predictor was exposure to sustainability education ($\beta = 0.56$, $t = 6.98$, $p < 0.01$), followed by certification credibility perceptions ($\beta = 0.34$, $t = 4.71$, $p < 0.01$). A weaker but still significant effect was found for younger age (18–34 years; $\beta = 0.26$, $t = 3.13$, $p < 0.05$). Gender and education level did not yield statistically significant results. These findings suggest that sustainability education and perceived credibility are key levers in encouraging sustainable accommodation choices.

4.3 Structural Equation Modelling Results

Structural Equation Modelling (SEM) was used to test the hypothesised mediation model, in which perceived certification credibility mediates the relationship between perceived sustainability efforts and customer loyalty. The SEM model demonstrated good fit to the data: $\chi^2 = 138.56$, $df = 78$, $p < 0.001$; CFI = 0.96; TLI = 0.94; RMSEA = 0.048; SRMR = 0.045.

The analysis confirmed that perceived sustainability efforts had a significant positive effect on certification credibility ($\beta = 0.69$, $p < 0.001$), and certification credibility in turn positively influenced customer loyalty ($\beta = 0.63$, $p < 0.001$). The indirect effect of sustainability efforts on loyalty through certification credibility was also significant (indirect effect = 0.43, $p < 0.001$). These results support the hypothesised mediation model and

suggest that hotels can enhance consumer loyalty by clearly demonstrating their certification legitimacy and environmental responsibility.

Additionally, hotels certified under globally recognised frameworks (e.g., ISO 21401:2019, GSTC) scored significantly higher in consumer confidence than those with lesser-known certifications (Durband, 2021).

4.4 Cluster Analysis Results

Table 5 below summarises the average values of key demographic, behavioural, and sustainability-related variables for each cluster.

Table 5: Consumer Clusters - Average values of key variables per cluster

Key Variables	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Average trips per year	2.1	2.8	3.4	2.9
Sustainable behaviour (overall mean)	2.7	3.2	4.4	3.8
Willingness to pay premium (1-5 mean)	2.2	3.1	4.3	3.7
Importance is placed on certification	1.9	3.0	4.5	3.9

Source: Authors' elaboration.

The clustering procedure using K-means resulted in 4 clearly distinguished consumer segments:

Cluster 1 ('Unaware Travellers'; n=30, 9.6%) showed the lowest average sustainability engagement (avg=2.7).

Cluster 2 ('Price-Conscious Pragmatists'; n=82, 26.4%) presented moderate sustainability awareness (avg=3.2).

Cluster 3 ('Sustainability Advocates'; n=151, 48.6%), the largest group, exhibited the highest level of awareness and sustainable behaviour (avg=4.4).

Cluster 4 ('Balanced Idealists'; n=50, 16.1%) displayed moderate-to-high scores but showed flexibility and balancing of sustainability with comfort (avg=3.8).

The examination of consumer clusters uncovered clear patterns in sustainable travel preferences, with notable variations across different age groups and income brackets.

Through detailed analysis, we identified four distinct groups of respondents, each demonstrating unique perspectives and preferences regarding sustainability in the hospitality sector.

A statistical approach was employed using K-Means clustering, as described in section 3.4.2 of the methodology, to identify these clusters. The analysis was conducted on standardised numerical data from survey responses, focusing on sustainability awareness, behavioural patterns, and

decision-making priorities. In order to determine the optimal number of clusters, the Elbow Method (Ketchen & Shook, 1996) was employed by plotting the within-cluster sum-of-squares (WCSS) against a range of possible cluster numbers (from 2 to 10). The optimal solution was identified at the elbow point, where the addition of further clusters led only to minimal improvement in cluster homogeneity. Finally, the data used for clustering were standardised (converted to z-scores) before applying the K-means algorithm, ensuring the comparability of variables measured on different scales. The data was pre-processed by removing missing values and standardising the numerical features to ensure comparability. The final model grouped respondents into four distinct clusters (Table 6) based on their behavioural similarities, providing meaningful insights into sustainability preferences among travellers.

Table 6: Consumer Clusters Breakdown

Cluster	Name	Size	Key Characteristics
Cluster 1	Unaware Travellers	30 (9.6%)	Low sustainability awareness, cost-driven decisions
Cluster 2	Price-Conscious Pragmatists	82 (26.4%)	Moderate sustainability awareness, prioritise price and comfort
Cluster 3	Sustainability Advocates	151 (48.6%)	Highly informed, strongly prioritise sustainability
Cluster 4	Balanced Idealists	50 (16.1%)	Well-informed, flexible approach to sustainability

Source: Authors' elaboration.

The cluster segmentation reinforces the findings from the regression and SEM analyses. For instance, Cluster 3 ('Sustainability Advocates') aligns with respondents who reported high awareness, strong engagement in sustainable practices, and high willingness to pay for certified accommodations - a profile consistent with the influence of education and certification credibility shown in earlier models. In contrast, Cluster 1 ('Unaware Travellers') reflects the low-engagement consumer segment, which lacks exposure to sustainability messaging and places limited trust in certifications. These results support the central hypothesis that educational exposure and perceived certification credibility are key drivers of sustainable tourism behaviour.

While a significant portion of respondents (Cluster 3) are highly committed to sustainable tourism, others balance sustainability with practical

concerns (Clusters 2 and 4), and a minority (Cluster 1) show little interest in the subject. These insights can inform hospitality providers how to tailor their offerings and communication strategies to appeal to different traveller segments.

Younger travellers (18-34 years old) exhibit a higher awareness and preference for sustainability-certified accommodations, whereas older travellers demonstrate less familiarity. Furthermore, most travellers do not actively seek out certified accommodation when booking, suggesting that awareness alone does not translate into behaviour change.

The analysis identified two primary consumer segments: sustainability-driven travellers, who prioritise certifications and sustainable practices, and experience-driven travellers, who consider sustainability secondary to comfort and amenities. The former group demonstrated a higher willingness to pay a premium for certified accommodation, aligning with findings from Martínez García de Leaniz et al. (2018), which showed that environmentally conscious travellers are 30% more likely to choose certified properties.

Table 7 illustrates that sustainability-driven travellers emphasise certifications and eco-friendly practices and are significantly more inclined to pay a premium for certified accommodation. This reinforces the notion that environmental credentials substantially influence consumer choice in the hospitality sector.

Table 7: Consumer Segments – Willingness to Pay Premium for Certified Accommodation

Consumer Segment	Mean Premium Payment Rating (out of 5)	Standard Deviation	Key Characteristics
Sustainability-driven travellers	4.10	0.65	Prioritise certifications and sustainable practices; be environmentally conscious; be 30% more likely to choose certified properties (Martínez García de Leaniz et al., 2018).
Experience-driven travellers	3.45	0.80	Value comfort and amenities over sustainability; view sustainability as secondary in the decision process.

Source: Authors' elaboration.

Findings highlight that perceived certification credibility significantly influences consumer trust and booking decisions. Regression analysis shows that travellers who receive clear sustainability messaging are more likely to prioritise certified accommodations. However, many hotels fail to communicate their sustainability initiatives effectively, leading to consumer confusion. Respondents ranked transparency, storytelling, and visible

certification logos as effective ways to build trust. Additionally, findings suggest that education about sustainability initiatives during the booking process (e.g., through OTAs, hotel websites, and social media) can increase engagement.

The findings indicate that digital engagement, influencer partnerships, and incentive-based strategies can enhance consumer preference for certified accommodations.

Lastly, the study outlines targeted marketing strategies to engage the two primary traveller segments, sustainability-driven and experience-driven consumers:

Personalised digital campaigns targeting younger, eco-conscious travellers.

Gamification and reward systems, such as discounts for choosing sustainable options.

Integration with online travel agencies (OTAs), ensuring sustainability certifications are prominently displayed.

Authenticity in messaging to combat scepticism and prevent green-washing.

5. Discussions

This study examined how sustainability certifications and eco-friendly practices influence accommodation preferences among Italian travellers. The findings demonstrate that although many consumers express positive attitudes towards sustainability, certifications alone exert limited influence on booking behaviour. This suggests that awareness and perceived credibility, rather than certification status per se, are the primary drivers of sustainable choice.

Consistent with prior research (Martínez García de Leaniz et al., 2018), the regression analysis revealed that exposure to sustainability education and perceived certification credibility are the strongest predictors of preference for certified accommodations. SEM results (Section 4.3) confirmed the mediating role of certification credibility between perceived sustainability efforts and consumer loyalty. These findings reinforce the importance of transparent, trustworthy communication in hospitality sustainability strategies, an area where many businesses currently fall short.

Despite the presence of sustainability messaging, most respondents displayed limited familiarity with certification standards, including ISO 21401:2019 and GSTC. This gap in consumer understanding mirrors the well-known “attitude-behaviour gap” (Juvan & Dolnicar, 2014), where pro-environmental intentions do not translate into action due to information asymmetries, trust issues, or convenience trade-offs. This points to an urgent need for clearer consumer education and more visible, engaging

certification communication, for instance, through OTAs, hotel websites, or booking platforms.

Notably, demographic variables such as gender and education level had little predictive value, while younger consumers (18–34) showed significantly higher engagement. This supports research suggesting generational divides in sustainability preferences (Tata et al., 2023) and signals opportunities for targeted digital campaigns aimed at eco-conscious millennials and Gen Z.

Cluster analysis (Section 4.4) further supports this segmentation: Cluster 3, the sustainability advocates, exhibited high awareness, behavioural engagement, and willingness to pay a premium for certified accommodations. Conversely, Cluster 1, the unaware travellers' segment, demonstrated low engagement, limited trust, and minimal responsiveness to sustainability claims. These distinctions underscore the need for differentiated marketing strategies: while some travellers respond to environmental messaging, others prioritise comfort and value, necessitating a balance between sustainability and service quality (Jones et al., 2016).

The findings also draw attention to potential credibility risks, including greenwashing (Papagiannakis et al., 2024), where superficial adoption of certification can erode trust. If certification schemes are to maintain relevance, more vigorous enforcement and transparency mechanisms are essential. Hospitality providers and certifiers must work collaboratively to ensure that sustainability claims are both substantive and verifiable.

Finally, this research contributes to the broader literature on sustainable tourism by combining psychometric measurement, SEM, and behavioural segmentation to reveal the nuanced ways in which awareness, trust, and education shape sustainable consumer behaviour. Future studies should explore how technological innovations (e.g., blockchain-based verification) enhance certification credibility and reduce consumer scepticism. Longitudinal research would also be valuable in tracking how consumer attitudes evolve over time and in response to changing environmental or regulatory contexts.

6. Conclusions and implications

This study explored how awareness and credibility of sustainability certifications influence accommodation choices among Italian travellers. Drawing on survey data and robust statistical modelling (regression, SEM, and cluster analysis), we answered three core research questions concerning awareness (RQ1), the mediating role of certification credibility (RQ2), and communication strategies for promoting sustainable accommodations (RQ3).

Regarding RQ1, the overall awareness of sustainability certifications is moderate, with significant variability across age groups. Younger travellers (18–34) demonstrated greater engagement and familiarity with labels such as ISO 21401:2019 and the EU Ecolabel, while older respondents showed limited awareness. This finding underscores the need for targeted educational campaigns to make certification schemes more recognisable and relevant across generations (Kim, 2025; Reiser & Simmons, 2005).

For RQ2, the SEM analysis confirmed that certification credibility significantly mediates the relationship between hotels' perceived sustainability efforts and consumer loyalty ($\beta = 0.63$, $p < 0.001$). This reinforces the findings of Agu et al. (2024), affirming that credibility and transparency are essential to building trust and influencing booking behaviour.

Concerning RQ3, the findings suggest actionable strategies for hospitality providers and certifying bodies. Effective communication should: (i) clearly articulate the environmental and social impact of certifications, (ii) use storytelling and real-life examples to increase emotional engagement, (iii) incorporate infographics and videos to simplify complex information, and (iv) ensure visibility of certification details on booking platforms (Bowden & Mirzaei, 2021).

Marketing strategies should include digital campaigns targeted at younger travellers, partnerships with influencers, gamification and reward systems, and integration with online travel agencies (Kreeger et al., 2025). Importantly, messaging must remain authentic to avoid greenwashing (Pagiannakis et al., 2024).

Despite generally favourable attitudes toward sustainability, the findings reveal a persistent attitude–behaviour gap (Juvan & Dolnicar, 2014). Many travellers value certifications in theory but do not actively prioritise them when booking. Bridging this gap requires not only transparent communication but also engaging, educational experiences embedded in the guest journey.

This study contributes to the growing literature on sustainable tourism by empirically validating the influence of certification credibility on consumer behaviour and offering a typology of traveller segments (Seyfi et al., 2023; Sthapit et al., 2024). It also highlights the importance of rigorous certification systems such as EMAS, which offer both environmental transparency and continuous improvement, thereby strengthening trust.

This study has several limitations that should be acknowledged. Firstly, a convenience sampling method was utilised, potentially resulting in a sample that may not fully represent all segments of travellers, thereby influencing the generalizability of our findings. Additionally, our sample size of approximately 300 respondents, though adequate for exploratory analysis, limits the precision and strength of inferential statistical conclusions. Furthermore, the cross-sectional design restricts assertions regard-

ing causality and does not account for evolved perceptions and behaviours over time.

Future research employing longitudinal methods could provide deeper insights. Lastly, the reliance on self-reported data raises concerns of possible response biases, which could affect the accuracy of the findings. Despite these limitations, the study contributes valuable insights to the body of research on sustainability certifications in hospitality, yet acknowledging these constraints encourages cautious interpretation and points toward directions for refinement in future investigations.

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