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RECEIVED 14 May 2025

ACCEPTED 25 July 2025

PUBLISHED 05 August 2025

CITATION

Dedat S and Rodrigues RI (2025) Perceived sustainability improves guest loyalty in hospitality sector.
Front. Sustain. 6:1628871.
doi: 10.3389/frsus.2025.1628871

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Perceived sustainability improves guest loyalty in hospitality sector

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Introduction: This study explores how the environmental, economic, and social dimensions of sustainability influence guest loyalty and, subsequently, their intention to revisit the same hotel. It builds on the premise that positive perceptions of sustainable practices may play a critical role in strengthening the relationship between guests and hospitality brands.

Methods: A cross-sectional survey was conducted with a sample of 348 hotel guests. The data were analysed using structural equation modelling and mediation analysis to examine the relationships among the key variables.

Results: Findings reveal that favourable perceptions of sustainability initiatives significantly enhance revisit intentions, with guest loyalty serving as a central mediating variable. The three pillars of sustainability exert distinct effects, underscoring the importance of adopting differentiated and targeted sustainability strategies in the hospitality sector.

Discussion: The study highlights the practical importance of clearly and authentically communicating sustainable actions to foster emotional engagement and long-term guest relationships. By demonstrating the strategic role of sustainability in building loyalty and encouraging responsible tourism behaviour, the findings challenge the assumption that all sustainability dimensions are equally effective. This research offers both theoretical refinement and actionable insights for hospitality managers seeking to integrate sustainability into the brand experience.

KEYWORDS

sustainability, triple bottom line, customer loyalty, return intention, hospitality industry

1 Introduction

The growing global concerns with climate change, social inequality, and economic instability have transformed sustainability into a strategic priority for multiple industries, including the hospitality sector (González-Rodríguez et al., 2020; Miller and Torres-Delgado, 2023). Within this context, sustainable practices are no longer seen as merely ethical or regulatory obligations, but as critical elements in enhancing competitiveness and fostering customer loyalty (Han and Hyun, 2018; Pereira-Moliner et al., 2021). Guests increasingly favour hotels that reflect their values, such as those committed to environmental protection, support for local communities, and responsible economic practices (Khatter et al., 2021; Shoukat and Ramkissoon, 2022).

Despite the growing interest in sustainable hospitality, most studies have analysed sustainability as a unidimensional construct or have treated the triple bottom line as a homogeneous framework (Pereira-Moliner et al., 2021; Wong and Kim, 2020; Han et al., 2019; Martinez et al., 2014). This approach overlooks the possibility that the environmental, economic, and social pillars may exert distinct effects on consumer behaviour (Khatter et al., 2021; Zou et al., 2022). Furthermore, the psychological mechanisms through which these

sustainability dimensions influence behavioural intentions—such as the decision to return to the same hotel—remain underexplored (Sun et al., 2022; Uludag et al., 2024). In particular, the mediating role of customer loyalty has received limited empirical attention, despite its recognised strategic relevance (Han et al., 2019; Shoukat and Ramkissoon, 2022). These gaps limit our understanding of how hotels can effectively implement and communicate sustainable practices to strengthen customer relationships.

To address this gap, this study aims to analyse the individual effects of the three sustainability pillars—environmental, economic, and social—on guests' intention to return, considering the mediating role of customer loyalty. A quantitative, cross-sectional study was conducted with a probabilistic sample of 348 hotel guests. Using structural equation modelling and mediation analysis, we explored the relationships between perceived sustainability practices, loyalty, and behavioural intentions.

This study contributes to the literature by offering a different perspective on the impact of sustainability on consumer behaviour, revealing that each pillar exerts distinct effects and that customer loyalty acts as a key mediating mechanism. Therefore, it seeks to answer the following research question: How do the three pillars of sustainability—environmental, economic, and social—influence guests' intention to return to the same hotel, considering the mediating role of customer loyalty?

The results are important for hospitality managers to strengthen guest loyalty through strategic and authentic sustainability practices. The article is structured as follows: the following section describes the theoretical framework and hypotheses, followed by the methodology, results, discussion, and conclusions.

2 Theoretical background

2.1 Sustainability in the hospitality industry

The conceptual foundation of this study draws from the Triple Bottom Line (TBL) framework (Elkington, 1997), which defines sustainability through three interdependent dimensions: environmental, economic, and social. In parallel, the proposed hypotheses are guided by attitudinal models of consumer behaviour that highlight the role of emotional and psychological mechanisms, such as customer loyalty, in transforming values and perceptions into behavioural intentions (Han et al., 2019; Sun et al., 2022). Together, these frameworks support the mediation model tested in this research.

The incorporation of sustainable practices in the hospitality sector, beyond significantly contributing to environmental preservation and social progress, also serves as a differentiating and strategic factor in strengthening the competitiveness of hotels and fostering long-term relationships with customers (Wong and Kim, 2020). The tourism and hospitality sector—a core component of the global economy—encompasses a wide range of establishments dedicated to providing accommodation, food and beverage services, event organisation, and leisure activities (Page and Connell, 2020). Hotels can be categorised into different typologies (e.g., hotels, resorts, guesthouses) depending on the type of service offered, star classification, target market segment, or geographic location (Migdadi, 2024).

With the increase in environmental awareness and the pressure exerted by consumers and stakeholders, there has been a growing

demand for sustainable practices within the sector. This has led to the adoption of measures such as improving energy efficiency, implementing responsible waste management, using renewable energy sources, and reducing carbon footprints (Murphy and Gouldson, 2020). Guests appreciate personalised and authentic experiences that align with their values, preferring establishments committed to environmental and social wellbeing (Shoukat and Ramkissoon, 2022). Differentiation based on service quality, innovation, and sustainability has become an essential vector for the success and longevity of hospitality businesses (Pereira-Moliner et al., 2021). In this context, it is crucial to understand how sustainable strategies, when linked to the construction of loyal customer relationships, influence return intentions (Tostões, 2022).

This dynamic is closely related to the concept of conscious consumption, which refers to consumers' tendency to consider ethical and sustainable criteria when making purchasing decisions (White et al., 2019). Rather than focusing solely on functional needs, guests seek to align their choices with broader causes such as environmental preservation or social equity (Han et al., 2019). When a hotel's practices are perceived as authentic and aligned with these values, guests tend to form symbolic and emotional connections with the brand, reinforcing their loyalty and increasing the likelihood of returning (Uludag et al., 2024).

The three pillars of sustainability—environmental, economic, and social—play a central role in how hotels operate, position themselves in the market, and interact with various stakeholders (Miller and Torres-Delgado, 2023). Environmental sustainability refers to minimising the ecological impact of hotel operations through the efficient use of natural resources, ecosystem conservation, and the implementation of practices such as recycling, water and energy management, and waste reduction (Khatter et al., 2021). Economic sustainability entails balancing business profitability with social responsibility and efficient resource management, promoting financially viable and resilient business models committed to long-term value creation (Njoroge et al., 2020; Qiu et al., 2019). Social sustainability focuses on valuing human capital and local communities, fostering inclusion, equity, professional development, and partnerships with social initiatives that promote education, health, and culture (Jäggi, 2022).

The integrated and effective implementation of these three pillars contributes to the sustainable development of the sector, strengthens the hotel's value proposition, enhances guest satisfaction, and boosts customer loyalty. Therefore, sustainability is no longer solely an ethical or legal responsibility but has become a strategic element critical to consolidating business competitiveness and long-term sustainability (TravelPerk, 2023).

2.2 Relationship between sustainable practices and the intention to return to the same hotel

Return intention is a key indicator in hotel management, as it reflects guests' predisposition to return to the same hotel based on their previous experiences. This behaviour is often interpreted as an expression of customer loyalty and has a direct impact on the financial and operational sustainability of hospitality businesses (Viet et al., 2020). Among the main factors influencing return intention are

service quality, personalised attention, problem-solving effectiveness, the comfort of facilities, and perceived value for money (Padlee et al., 2019). The opportunity to experience memorable stays, marked by positive emotions and interaction with the local culture and community, tends to significantly increase return intentions (Bec et al., 2019). Such positive experiences enhance the perceived value of the service and create emotional bonds that encourage repeat visits (Viet et al., 2020).

Environmental, social, and economic practices—the three fundamental pillars of sustainability—can directly influence consumers' perceived value and, consequently, strengthen their intention to return to the hotel (Pereira-Moliner et al., 2021). Environmental measures such as efficient management of natural resources, reduction in energy and water consumption, and waste minimisation policies can significantly enhance a hotel's image among customers increasingly aware of environmental issues (Han and Hyun, 2018). The adoption of socially responsible practices that promote employee wellbeing, involve the local community, and value cultural authenticity also positively impacts guest satisfaction, contributing to the strengthening of emotional ties (Pereira-Moliner et al., 2021). In the economic dimension, transparency and responsibility in financial management, including fair pricing practices and clear communication of value, consolidate customer trust and loyalty (Njoroge et al., 2020).

Therefore, return intention can be understood as a behavioural manifestation of loyalty, strongly influenced by the effective integration of the three pillars of sustainability into hotels' operational and communication strategies. Understanding the nature of these factors enables the development of integrated strategic approaches capable of fostering long-term customer relationships, enhancing institutional reputation, and ensuring sustainable growth (Zou et al., 2022).

Previous studies suggest that sustainability practices influence not only how customers perceive the value of a service, but also their behavioural intentions, including the likelihood of returning to the same hotel (Han and Hyun, 2018; Viet et al., 2020). When sustainability is authentically communicated and integrated into the guest experience, it reinforces perceptions of trust, responsibility, and brand identification. It is therefore reasonable to expect that stronger perceptions of sustainability will be associated with increased return intentions.

Based on this evidence, the first research hypothesis was formulated:

Hypothesis 1: Each of the three pillars of sustainability—environmental (H1a), economic (H1b), and social (H1c)—is expected to influence guests' intention to return, although with potentially distinct effects.

2.3 Influence of the three pillars of sustainability on customer loyalty

Customer loyalty is recognised as one of the main strategic objectives in the hospitality sector, being influenced by several factors, among which sustainable practices stand out (Han et al., 2019). In this context, the three pillars of sustainability—environmental, economic, and social—play an important role in building long-term relationships between guests and hotels (Shoukat and Ramkissoon, 2022).

Customers value the preservation of natural resources, the reduction of negative impacts on ecosystems, and the environmental responsibility demonstrated by hotels (Khatter et al., 2021). When these actions are perceived as authentic and consistent, they foster customer identification with the hotel's values and promote loyalty (Sun et al., 2022). Sustainability is also reflected in efficient resource management aimed at ensuring financial viability without compromising service quality (Yusof et al., 2017). The adoption of energy-efficient technologies, the promotion of local products, or the reduction of operational costs can directly benefit guests, both at the level of the experience and the final price (Qiu et al., 2019). When customers perceive that resources are managed responsibly and transparently, they tend to develop a higher degree of trust and loyalty towards the hotel (Pereira-Moliner et al., 2021).

Respect for workers' rights, investment in the continuous training of teams, and support for local social and cultural initiatives reflect a concern for collective wellbeing (Jäggi, 2022). Studies conducted by Uludag et al. (2024) show that guests recognise and value such engagement, especially when they perceive that their choice contributes to relevant social causes. The perception of a genuine commitment to sustainable practices reinforces the emotional engagement with the hotel, consolidating lasting relationships that go beyond mere momentary satisfaction (Shoukat and Ramkissoon, 2022).

Research shows that customer loyalty is shaped not only by service quality and satisfaction, but also by value alignment and emotional connection (Shoukat and Ramkissoon, 2022; Uludag et al., 2024). When guests perceive that a hotel is genuinely committed to sustainability—whether through environmental care, economic responsibility, or social engagement—they are more likely to trust the brand and develop a lasting bond. Thus, each pillar of sustainability may contribute meaningfully to the development of customer loyalty.

Based on the reviewed literature, the second research hypothesis was formulated:

Hypothesis 2: The environmental (H2a), economic (H2b), and social (H2c) practices implemented by hotels have a positive impact on customer loyalty.

2.4 Mediation model

The theoretical foundation of this study draws on the TBL approach (Elkington, 1997), which conceptualises sustainability through three interdependent pillars: environmental, economic, and social. Additionally, the study is anchored in attitudinal models of consumer behaviour, particularly those that recognise the role of emotional and relational mechanisms, such as customer loyalty, in translating values into actions (Han et al., 2019; Sun et al., 2022). This framework allows us to examine not only the direct effects of sustainability perceptions but also the psychological processes that mediate behavioural intentions.

The relationship between sustainable practices implemented by hotels and customers' intention to return does not occur exclusively through a direct pathway (Han et al., 2019). This intention may be influenced by attitudinal or emotional mediating variables (Uludag et al., 2024). Within this context, customer loyalty emerges as a central mediating variable, acting as a bridge between the perception of

sustainable practices and the intention to return to the same hotel (Sun et al., 2022).

Environmentally conscious customers tend to value hotels that adopt sustainable environmental practices. According to Khatter et al. (2021), such initiatives not only meet the expectations of an increasingly environmentally aware segment of consumers but also enhance the organisation's credibility and reputation. These practices increase guest satisfaction and emotional engagement, promoting loyalty, which acts as a mediator between the positive perception of environmental initiatives and the intention to return (Han et al., 2019).

Management practices that demonstrate a balance between operational efficiency and a commitment to economic sustainability are also highly valued by customers. Research by Qiu et al. (2019) shows that strategies promoting profitability without compromising service quality (e.g., the use of sustainable technologies, the adoption of fair pricing policies) are perceived as indicators of responsibility and organisational maturity. When these practices are communicated clearly and consistently, they strengthen guests' trust, thus enhancing their loyalty (Njoroge et al., 2020). Khan et al. (2020) further emphasise that trust is a decisive factor in customer loyalty.

Initiatives such as supporting cultural projects, hiring local employees, or investing in continuous training are perceived as indicators of corporate social responsibility (Lee and Kim, 2013). When guests recognise such engagement, they tend to identify with the hotel and develop an emotional connection to their experience (Jäggi, 2022). This connection translates into a higher degree of loyalty, acting as a mediating mechanism between the perception of social responsibility and the decision to return. The mediation model thus allows for understanding that the effects of sustainable practices on return intention are also influenced by loyalty (Yusof et al., 2017). This variable mediates the relationship between perceived sustainability and future behaviour, reinforcing the importance of an integrated and coherent management of environmental, economic, and social practices within the hospitality sector (Han et al., 2019).

While sustainability practices may directly influence return intentions, the strength of this relationship often depends on the

emotional and attitudinal responses they elicit. Loyalty, as an internalised form of brand connection, plays a pivotal role in transforming sustainability perceptions into behavioural intentions (Han et al., 2019; Sun et al., 2022). It is therefore expected that customer loyalty will mediate the relationship between the three sustainability pillars and the intention to return.

Guest loyalty has been widely recognised as a key attitudinal and emotional response to consistent service quality and value alignment (Han et al., 2019). In the context of sustainability, loyalty often reflects the guest's psychological attachment to a brand perceived as ethical, responsible, and trustworthy (Sun et al., 2022; Shoukat and Ramkissoon, 2022). Prior studies have tended to explore the direct relationship between sustainability and behavioural intentions, without accounting for the psychological mechanisms that underpin this link. By introducing loyalty as a mediating variable, this study seeks to clarify how perceptions of sustainable practices are internalised and transformed into revisit intentions. This approach adds nuance to the literature and highlights loyalty as a central mechanism through which sustainability translates into customer behaviour.

Based on these considerations, the third research hypothesis was developed:

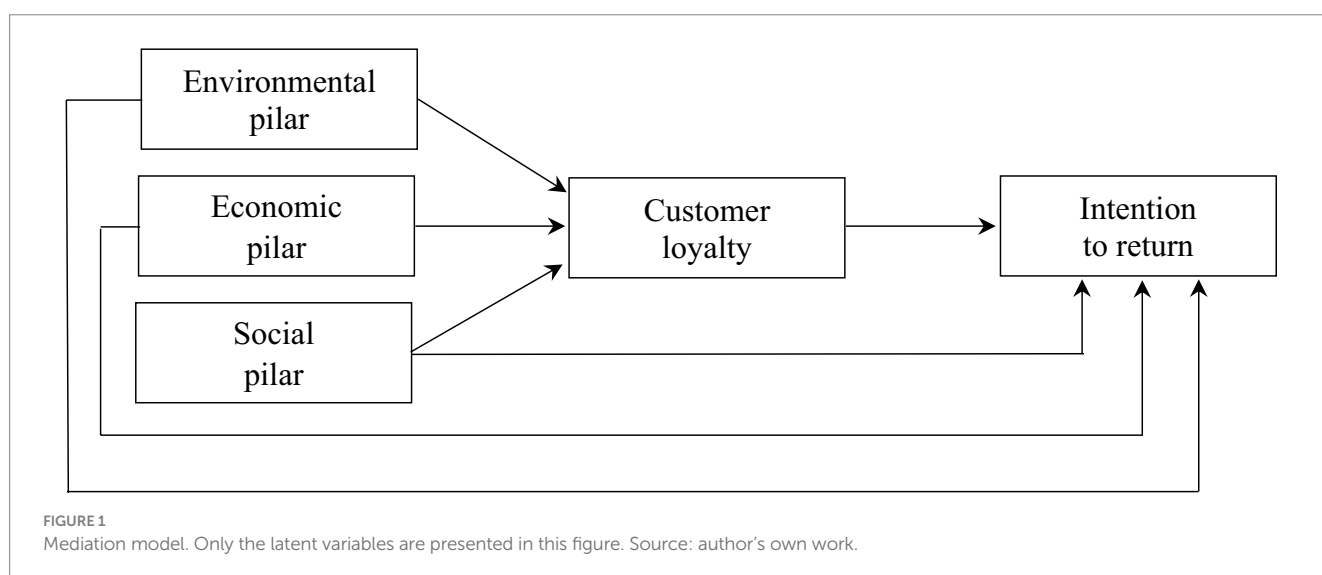
Hypothesis 3: Guest loyalty mediates the relationship between the environmental, economic, and social sustainability practices implemented by hotels and guests' intention to return.

H3a: Guest loyalty mediates the relationship between the environmental pillar and revisit intention.

H3b: Guest loyalty mediates the relationship between the economic pillar and revisit intention.

H3c: Guest loyalty mediates the relationship between the social pillar and revisit intention.

Figure 1 presents the conceptual model of the study, highlighting the proposed relationships between the variables and the respective research hypotheses.



3 Methodology

This research, adopting a cross-sectional design, employed a quantitative approach to analyse the interactions among the studied variables and to test the proposed hypotheses. Data were collected through an online survey, using probabilistic sampling. This method allows for more representative results, thereby increasing the validity and generalisability of the study's conclusions (Wang, 2024).

3.1 Sample

According to PORDATA (2024), Portugal had approximately 1,800 officially classified hotels. In Mozambique, recent tourism reports indicate the existence of over 8,500 lodging establishments, including hotels, collectively offering more than 45,000 rooms (GlobeNewswire, 2024). The sample was drawn from 32 hotels (17 in Portugal and 15 in Mozambique), covering different regions and classifications (from three to five stars). This number reflects the typical guest volume per hotel during the data collection period and provides a representative cross-section of the hospitality sector in both countries.

The study involved the participation of 348 guests who stayed in hotel establishments between January and March 2025, with 50.6% of the sample comprising male respondents. Participants' ages ranged from 19 to 76 years, with a mean age of approximately 40 years (SD = 11.92). Table 1 presents a detailed description of the participants' sociodemographic characteristics.

TABLE 1 Sample characteristics.

Sociodemographic variables	<i>n</i> = 348
Sex	176 (50.6%)
Male	172 (49.4%)
Female	
Age group (<i>M</i> = 40.40; <i>DP</i> = 11.92)	74 (21.3%)
≤ 30 years	114 (32.8%)
31–40 years	90 (25.9%)
41–50 years	70 (20.1%)
≥ 51 years	
Nationality	62 (17.8%)
Angolan	24 (6.9%)
Brazilian	20 (5.7%)
Spanish	88 (25.3%)
Mozambican	94 (27.0%)
Portuguese	28 (8.0%)
South African	32 (9.2%)
Other nationality (e.g., English, Ukrainian, Indian)	
Educational qualifications	167 (48.0%)
Secondary/vocational education	181 (52.0%)
Higher education	

Source: author's own work.

3.2 Data collection instruments

3.2.1 Triple bottom line scale

To assess the sustainable practices implemented by hotels, 15 items originally developed by Poudel et al. (2014) and later validated for the Portuguese population by Almeida et al. (2025) were adapted. This scale covers the three pillars of sustainability: (i) environmental (e.g., "The activities promoted by this hotel encourage the conservation of natural areas"); (ii) economic (e.g., "The activities promoted by this hotel create new markets for local products"); and (iii) social (e.g., "The activities promoted by this hotel provide opportunities for participation in local cultural activities"). The internal consistency of the three subscales proved satisfactory both in previous studies and in the present research, with Cronbach's alpha values ranging between 0.73 and 0.89.

3.2.2 Customer loyalty questionnaire

Customer loyalty was assessed based on an adaptation of seven items originally developed by Suárez et al. (2007) and subsequently used by Martínez et al. (2014) (e.g., "This hotel is always my first choice"). The Cronbach's alpha coefficients obtained ranged between 0.86 and 0.90, indicating adequate internal consistency.

3.2.3 Behavioural intention questionnaire

The intention to return was measured using three items adapted by Rodrigues et al. (2024) from the original scale developed by Mason and Paggiaro (2012). The adaptation involved rewording the items to explicitly reference hotel stays (e.g., "If I visit this region again, I will definitely choose this hotel"), simplifying language for cultural clarity, and adjusting the response format to a 7-point Likert scale. The scale demonstrated good internal consistency, with Cronbach's alpha coefficients ranging from 0.81 to 0.85 in previous applications and 0.84 in the current sample.

To ensure transparency and facilitate replication, all questionnaire items are listed in Appendix.

3.2.4 Control variables

Age and gender were used as control variables. According to Khan et al. (2020), personal characteristics such as age and gender influence customer loyalty in the hospitality sector. Hou and Wu (2020) add that younger customers tend to be more aware of environmental and social issues and are therefore more likely to return to hotels that implement sustainable practices. Moreover, Moise et al. (2021) show that gender influences perceptions and responses to green practices adopted by hotels, with women generally being more receptive to such initiatives. When sustainable practices are aligned with customers' values and expectations, they reinforce brand identification, increase loyalty, and enhance return intentions (Norazah and Norbayah, 2015).

3.3 Procedure

Data collection was conducted online through the administration of a survey. The survey link was shared with guests from various hotels after obtaining prior authorisation from hotel managers. At the beginning of the questionnaire, the objectives of the study were presented, and participants were assured of the anonymity and

confidentiality of their responses. The statistical analysis of the data was carried out using SPSS (version 30) and AMOS (version 29).

3.4 Statistical analysis

Data were analysed through a multi-step procedure: descriptive statistics and normality tests (skewness, kurtosis, Mardia's coefficient); regression analyses for H1 and H2; structural equation modelling for overall model testing; and mediation analysis using PROCESS macro (Model 4) to test H3. All analyses were performed using SPSS 29 and AMOS 29.

The verification of multivariate normality was conducted using Mardia (1980) coefficient, which assesses skewness and kurtosis indices, as well as the associated statistical significance (p -value). The results indicated that this assumption was met (Mardia_{skewness} = 4.648, p = 0.584; Mardia_{kurtosis} = 8.824, p = 0.421), as the standardised value of Mardia's coefficient exceeded 5% (p > 0.05; Hossain et al., 2022; Mardia et al., 2024). Moreover, skewness values (ranging from −1.12 to 0.97) and kurtosis values (ranging from 0.50 to 1.25) fell within the recommended interval of [−1.5; 1.5], making them suitable for the application of structural equation modelling (Lam and Zhou, 2020).

As data were collected through self-reported questionnaires from a single respondent source, the potential for common method bias must be acknowledged. To mitigate this risk, we ensured respondent anonymity, used multi-item scales, and varied item wording to reduce consistency artifacts. Additionally, Harman's single-factor test was performed, including all items, to assess the presence of common method variance (Kock et al., 2021). The results revealed a single-factor solution accounting for 47.1% of the total variance, indicating that the model was not significantly compromised by this type of bias. Future studies could strengthen construct validity by adopting multi-source data or longitudinal research designs.

Regarding construct validity, the results confirmed convergent validity, with Average Variance Extracted (AVE) values exceeding 0.50 and Composite Reliability (CR) values above the recommended threshold of 0.70 (Cheung et al., 2024). Discriminant validity was assessed using three complementary criteria. First, Maximum Shared Variance (MSV) values were lower than the respective AVEs, in line with Acar et al. (2023). Second, the Fornell-Larcker criterion was applied, confirming that the square root of the AVE for each construct exceeded its correlations with other constructs. Finally, the

Heterotrait-Monotrait Ratio (HTMT) was also calculated, with all values remaining below the conservative cut-off of 0.85, indicating that the constructs are empirically distinct (Henseler et al., 2015).

Finally, it was observed that, with the exception of age and gender, all variables were significantly correlated (Table 2). These results suggest that the sociodemographic variables mentioned do not interfere with the relationship between the pillars of sustainability, customer loyalty, and the intention to return to the same hotel.

Subsequently, confirmatory factor analysis (CFA) was conducted to assess whether the observed variables adequately represented the underlying latent constructs, as proposed by Alavi et al. (2020). The results indicated that the model demonstrated an adequate fit to the sample. [$\chi^2_{(262)} = 3.17$, $p < 0.001$, CFI = 0.91, TLI = 0.90; SRMR = 0.03, RMSEA = 0.07, LO90 = 0.07, HI90 = 0.08].

4 Results

Descriptive statistics were first presented to contextualise the study. It was found that 52.3% of the hotels were located in Portugal, while 47.7% were situated in Mozambique. Regarding star classification, 28.2% corresponded to three-star hotels, 52.3% to four-star hotels, and 19.5% to five-star hotels. Furthermore, the average length of stay was approximately one week (Min. = 2; Max. = 11; $M = 4.90$; $SD = 1.91$), with more than half of the respondents indicating that they had stayed between three and five nights.

Structural Equation Modelling (SEM) with maximum likelihood estimation was used to test the mediation model, assessing whether the relationship between the three pillars of sustainability and the intention to return was mediated by customer loyalty. The indicators revealed that the proposed model demonstrated a satisfactory fit [$\chi^2_{(266)} = 3.53$, $p < 0.001$, CFI = 0.90, TLI = 0.89; SRMR = 0.03, RMSEA = 0.08, LO90 = 0.08, HI90 = 0.09].

Hypothesis 1 suggested that the three pillars of sustainability—environmental (H1a), economic (H1b), and social (H1c)—influence the intention to return to the hotel. Multiple regression analysis revealed that both the environmental pillar ($\beta = 0.495$, $t = 6.622$, $p < 0.001$) and the economic pillar ($\beta = 0.421$, $t = 7.114$, $p < 0.001$) had a positive and significant impact on return intention. However, the social pillar did not present a significant effect ($\beta = -0.050$, $t = -0.738$, $p = 0.461$). The model explained 70.1% of the variance in return intention ($R^2 = 0.701$), with statistically significant model adjustment

TABLE 2 Descriptive statistics, composite reliability, and correlations among study variables.

Variable	<i>M</i>	<i>SD</i>	CR	AVE	MSV	1	2	3	4	
Intention to return	3.60 ¹	1.07	0.91	0.88	0.86	(0.85)				
Environmental pillar	3.35 ¹	0.94	0.90	0.64	0.77	0.810**	(0.86)			
Economic pillar	3.40 ¹	0.94	0.89	0.82	0.86	0.803**	0.857**	(0.87)		
Social pillar	3.46 ¹	0.99	0.90	0.80	0.73	0.740**	0.895**	0.826**	(0.86)	
Customer loyalty	3.49 ¹	0.96	0.93	0.81	0.78	0.852**	0.880**	0.854**	0.867**	(0.91)
Age	40.40	11.92	–	–	–	0.097	0.073	0.090	0.116	0.070
Sex	–	–	–	–	–	0.109	0.120	0.092	0.163	0.141

N = 348; ** $p < 0.001$; *M*, Mean; *SD*, Standard-deviation; CR, Composite Reliability; AVE, Average Variance Extracted; MSV, Maximum Shared Variance. ¹Scale ranging from 1 to 5; Cronbach's Alpha are in brackets. ²Sex codes: 0 = female; 1 = male. Source: Author's own work.

$[F_{(3, 344)} = 268.979, p < 0.001]$. These results suggest that guests are particularly responsive to sustainability practices that are tangible and visible during their stay—such as environmental initiatives and perceived economic value. In contrast, the lack of direct effect from the social pillar may reflect the limited visibility or perceived relevance of social actions to the guest experience.

Hypothesis 2, which postulated that the environmental (H2a), economic (H2b), and social (H2c) pillars have a positive impact on customer loyalty, was fully supported. The results revealed a positive and significant effect of the environmental pillar ($\beta = 0.340, t = 6.026, p < 0.001$), the economic pillar ($\beta = 0.307, t = 6.882, p < 0.001$), and the social pillar ($\beta = 0.309, t = 5.981, p < 0.001$) on customer loyalty. The model, with an $R^2 = 0.830$, demonstrated a high explanatory power regarding the variation in customer loyalty [$F_{(3, 344)} = 557.976, p < 0.001$]. These findings highlight the importance of sustainability as a relational driver. Guests appear to develop stronger emotional ties with hotels that adopt consistent and credible sustainability strategies—not only through visible environmental actions, but also through economic transparency and social responsibility. This suggests that loyalty is fostered not merely by service quality, but by the perception of shared values and long-term commitment.

Finally, Hypothesis 3 proposed that customer loyalty mediates the relationship between the three pillars of sustainability and the intention to return. The results of Model 4 of the PROCESS macro (Hayes, 2018) confirmed this mediating effect in all cases. The direct effect of the environmental pillar on return intention remained significant ($\beta = 0.307, p < 0.001$), while a significant indirect effect mediated by customer loyalty was also observed ($B = 0.619, SE = 0.067, 95\% CI [0.482, 0.746]$). Similarly, a significant direct effect ($\beta = 0.304, p < 0.001$) and an indirect effect through loyalty ($B = 0.570, SE = 0.059, 95\% CI [0.453, 0.682]$) were identified for the economic pillar. Finally, it was found that the direct effect of the social pillar on return intention was not significant ($\beta = 0.006, p = 0.926$); however, a strong indirect effect through loyalty was observed ($B = 0.838, SE = 0.065, 95\% CI [0.707, 0.962]$; see Table 3).

These findings underscore the central role of customer loyalty as the mechanism that transforms positive perceptions of sustainability into concrete behavioural intentions. The results are particularly revealing in the case of the social pillar, whose effect emerges only indirectly—through strengthened emotional connection and brand commitment. This implies that social initiatives may not immediately influence the decision to return, but they do so by enhancing the guest–brand relationship over time. Hotels should therefore invest in strategies that increase the emotional salience and visibility of their sustainability efforts to fully leverage their loyalty-building potential.

These results suggest that even when a sustainable practice does not have a direct impact on return intention, as observed with the social pillar, its influence may operate indirectly through the strengthening of customer loyalty to the hotel. This finding may be related to the fact that social practices are often less visible or less salient to customers compared to environmental initiatives (e.g., waste reduction, energy efficiency) or economic initiatives (e.g., support for local producers). Moreover, it was found that the social pillar influences return intention indirectly, suggesting that although social actions may not directly affect customers' decision to return, they contribute to strengthening the emotional bond with the hotel, which translates into a significant indirect effect.

5 Discussion

This study set out to understand how the environmental, economic, and social dimensions of sustainability influence guests' intention to return to a hotel, and whether this relationship is mediated by customer loyalty. The findings confirm that while all three pillars contribute to loyalty, only the environmental and economic dimensions directly affect revisit intention. These results clarify the psychological mechanisms linking sustainability to behaviour, and highlight the need to manage each pillar in differentiated ways.

This research contributes to the literature on green behaviour by disentangling the effects of distinct sustainability practices on loyalty and revisit intention. Most previous studies have examined sustainability as a global construct; our study shows that guests respond differently to each pillar. This refinement deepens our understanding of how value alignment and emotional identification mediate the influence of sustainability on behaviour—an underexplored pathway in the green consumer behaviour literature (White et al., 2019; Sun et al., 2022). The findings confirm that perceived authenticity, visibility, and value congruence are key drivers of behavioural outcomes in sustainable hospitality contexts.

From a managerial standpoint, the results provide evidence that hotels must go beyond implementing sustainable practices: they must communicate them clearly and authentically to build emotional engagement. Environmental and economic initiatives should be made more visible and tangible during the guest experience. Social initiatives, on the other hand, should be humanised and emotionally framed to enhance their relational impact. From a societal perspective, these insights can inform sustainability education, public campaigns, and hospitality training

TABLE 3 Indirect effects of sustainability pillars on return intention via customer loyalty: results from PROCESS mediation analysis.

Effects	B	SE	Bootstrapping CI	
			Lower	Upper
Total indirect effect				
Model 1: Environmental pillar → Customer loyalty → Intention to return	0.538	0.056	0.434	0.648
Model 2: Economic pillar → Customer loyalty → Intention to return	0.520	0.053	0.416	0.621
Model 3: Social pillar → Customer loyalty → Intention to return	0.733	0.054	0.631	0.835

B, Standardised beta; SE, Standard error; CI, Confidence intervals. Source: author's own work.

programmes aimed at promoting green tourism behaviour. Future research could explore whether the salience of sustainability dimensions varies across cultural contexts or guest segments, and whether different types of loyalty (e.g., affective vs. behavioural) respond differently to each pillar.

The findings partially confirmed Hypothesis 1, as the environmental (H1a) and economic (H1b) pillars positively influenced the intention to return, whereas the social pillar (H1c) did not show a significant direct effect. The importance attributed to environmental practices confirms that guests value hotels' ecological commitment, especially when these actions are visible, authentic, and consistent with their personal values (Sun et al., 2022). In the economic domain, the perception of efficient and transparent management reinforces customers' trust and their intention to return (Qiu et al., 2019). This result aligns with the studies by Khan et al. (2020), which highlight the appreciation for sustainable, balanced, and long-term value-oriented business models. In contrast, the social pillar did not show a significant direct impact, which may be related to the lower visibility of such practices during guests' stays (Jäggi, 2022). The literature suggests that the effects of social initiatives tend to manifest indirectly, depending on the degree of customer identification with the supported causes (Zou et al., 2022).

The full confirmation of Hypothesis 2 demonstrates that the three pillars of sustainability—environmental (H2a), economic (H2b), and social (H2c)—contribute significantly to customer loyalty. These results are consistent with the studies by Pereira-Moliner et al. (2021), who indicate that the perception of authentic and well-communicated ecological practices increases guests' trust, brand identification, and commitment. Viet et al. (2020) further add that the perception of a balance between cost and quality, combined with responsible financial conduct, strengthens customer loyalty to the hotel. Uludag et al. (2024) reinforce this perspective by stating that loyalty is fostered when customers recognise efficient, transparent management oriented towards fair value creation. Moreover, the data analysis revealed that engagement with the local community and commitment to collective wellbeing generate emotional bonds that enhance customers' sense of belonging, which is consistent with the findings of Murphy and Gouldson (2020).

The confirmation of Hypothesis 3 highlights that customer loyalty mediates the relationship between sustainable practices and the intention to return, with particular emphasis on the social pillar, whose effect was found to be exclusively indirect. This result underscores the relevance of loyalty as a psychological mechanism that translates the perception of sustainability into loyalty behaviours (Han et al., 2019). Research by Shoukat and Ramkissoon (2022) shows that customers do not automatically react to organisations' sustainable actions, but rather to how these actions are perceived, felt, and internalised. Consistency between communication and practice, coupled with a perception of authenticity, is essential for increasing trust and encouraging the intention to return. This mediation becomes particularly relevant in the case of social practices, whose effectiveness depends on the emotional involvement and identification of customers with the hotel's values (Sun et al., 2022).

To ensure the visibility and authenticity of sustainable practices, hotels should embed these initiatives throughout the

guest journey in ways that are both tangible and emotionally resonant. For example, environmental practices such as energy-saving systems, waste reduction programs, or sourcing from local suppliers can be actively showcased through in-room information, digital signage, or interactive guest experiences. Economic initiatives can be made visible by promoting fair pricing models or highlighting contributions to the local economy. As for social sustainability, authenticity can be strengthened by sharing real stories of community partnerships, employee training programmes, or inclusive hiring practices—preferably through narrative-driven communication across digital platforms. These actions reinforce trust, increase guest engagement, and align with the growing demand for meaningful and transparent hospitality experiences.

5.1 Theoretical contributions

This study contributes to a deeper understanding of sustainability within the hospitality sector by adopting an integrated and critical approach to analysing the impact of the three pillars of sustainability on customers' return intentions. Furthermore, it challenges the prevailing assumption in the literature that the environmental, social, and economic pillars exert homogeneous effects on consumer behaviour. The findings revealed a significant differentiation in the weight attributed to each pillar. It was found that the environmental and economic pillars exert a direct and significant influence on return intention, while the social pillar has only an indirect impact mediated by loyalty. These results suggest that the effectiveness of sustainable practices depends not only on their implementation but, more importantly, on how they are perceived and experienced by customers.

In particular, the results raise the hypothesis that social actions, often less visible or less understood, require specific communication and engagement strategies to translate into return behaviours. Additionally, the mediating role of customer loyalty highlights the importance of emotional and relational dimensions in consolidating the bond between the customer and the hotel. The findings demonstrate that loyalty emerges as a consequence of sustainable practices and of customers' identification with the brand's values, confirming its central role in converting perceptions into behaviours.

5.2 Practical implications

The findings provide relevant and actionable insights for hotel managers aiming to strengthen guest loyalty through sustainability-based strategies. Specifically, the fact that only practices perceived as visible and authentic influence return intention highlights the need to communicate sustainability commitments clearly, consistently, and in emotionally engaging ways.

In relation to the environmental pillar, the effectiveness of initiatives such as reducing plastic use or adopting renewable energy depends heavily on their visibility and coherent integration into the guest experience. Perceived authenticity is essential in transforming these actions into competitive advantages.

With respect to the economic pillar, although efficiency and transparency in management are not always directly perceived by guests, the perception of balance between price, value, and quality enhances trust and loyalty. Managers are therefore advised to adopt subtle yet effective communication strategies that highlight long-term and sustainable management practices.

As for the social pillar, the results suggest that social responsibility efforts should be made more visible and emotionally salient, for example, by humanising them through real stories, faces, and projects. Allowing customers to engage symbolically in these initiatives can reinforce their emotional bond with the hotel and enhance brand loyalty.

Finally, this research reinforces that loyalty is not limited to traditional reward programmes, such as points or discounts. The creation of emotional bonds, rooted in shared values and authentic experiences, plays a decisive role in increasing guests' intention to return and in stimulating positive word-of-mouth. Hotels that succeed in translating their sustainable practices into meaningful and engaging guest experiences will be better positioned to build long-term customer relationships.

5.3 Limitations and suggestions for future research

Despite the relevant contributions this study makes to the understanding of sustainability in the hospitality sector, some limitations must be acknowledged, which may constrain the generalisability and depth of the results obtained.

Firstly, although the sample size was adequate for the statistical analyses performed, the sampling was non-probabilistic and concentrated predominantly on guests from specific geographical regions and sociodemographic profiles. This limitation may restrict the applicability of the results to other cultural, economic, or territorial contexts where the perception of sustainability and its influence on loyalty and return intention might differ.

Secondly, the methodology relied exclusively on customers' subjective perceptions of the sustainable practices observed during their stay. While suitable for capturing consumer representations, this approach may not fully reflect the actual effectiveness or authenticity of the practices implemented by hotels. This issue is particularly relevant for the social pillar, whose direct impact was not confirmed, suggesting a possible discrepancy between the actual practices and their visibility or comprehension by guests.

Moreover, the study adopted a cross-sectional design, capturing the relationships between variables at a single point in time. Since loyalty is a dynamic and cumulative process, the lack of a longitudinal perspective limits the understanding of how the relationship between sustainable practices and return behaviours evolves over time.

Based on these limitations, several recommendations for future research are proposed. First, expanding the sample to include diverse geographical and cultural contexts is suggested, in order to test the robustness of the model across different markets and consumer segments. Replicating the study in cultures with varying levels of environmental and social awareness may offer valuable insights into the specificity of the effects observed.

In addition, a deeper exploration of the social pillar using qualitative methodologies, such as interviews or focus groups, is recommended. These methods would allow for a richer understanding of the perceptions, emotions, and symbolic interpretations associated with corporate social responsibility practices, clarifying why this pillar primarily exhibits an indirect effect.

Moreover, it would be pertinent to conduct longitudinal studies that track the evolution of customer loyalty over time. Such an approach would enable the analysis of phenomena such as reinforcement, erosion, or transformation of loyalty, depending on the consistency and authenticity of the sustainable practices perceived by guests.

Finally, it is recommended that future studies segment the analysis by customer type, comparing, for example, domestic versus international tourists, or regular versus first-time visitors. This line of research could identify potential differences in perception, valuation, and responsiveness to sustainable practices, thereby contributing to the development of more personalised and culturally sensitive loyalty strategies.

Beyond the variables analysed in this study, future research could explore how technological tools—such as mobile apps, augmented reality, or personalised guest interfaces—influence the perception and communication of sustainability in hospitality. These innovations may enhance the visibility, credibility, and emotional resonance of sustainable initiatives. In parallel, it would be valuable to examine how cultural contexts shape the way guests interpret and respond to sustainability practices, especially in cross-national or intercultural settings. Understanding these dynamics can help tailor strategies that resonate with diverse guest profiles and strengthen global sustainability engagement in the hospitality industry.

6 Conclusion

This study demonstrated that positive perceptions of sustainable practices implemented by hotels significantly influence guest behaviour. The findings validate the importance of the three pillars of sustainability—environmental, economic, and social—in building long-term relationships with customers. The results showed that environmental and economic practices exert a direct impact on return intention, whereas the social pillar acts mainly through an indirect effect mediated by customer loyalty. This finding reveals that, although all three pillars contribute to value creation in the hospitality sector, their effectiveness strongly depends on how they are perceived and experienced by customers. More than the mere existence of practices, their visibility, authenticity, and ability to generate emotional engagement are critical.

Customer loyalty emerges as a key mediating variable, functioning as the mechanism that transforms positive perceptions of sustainability into actual return behaviours. The findings reinforce the idea that hotels that communicate their sustainable actions clearly and consistently, while demonstrating authenticity in their commitment, are more likely to foster higher levels of customer loyalty.

The promotion of experiences that align with guests' personal values proves to be a decisive factor in strengthening competitiveness in the market. These results reiterate that sustainability should not be seen merely as a regulatory requirement or a market trend but rather as a structural pillar of the value proposition in contemporary hospitality.

The proposed model distinguishes itself by simultaneously integrating the three pillars of sustainability and by highlighting the mediating role of loyalty in the relationship between sustainable practices and return intention. Unlike previous approaches that postulate a direct, linear relationship between sustainability and return behaviours, this study demonstrates that affective loyalty is an essential prerequisite for converting the perception of sustainability into the intention to return.

In addition to offering relevant theoretical contributions, this study presents significant practical implications for the strategic management of hotel units, underlining the need to align authentic sustainable practices with effective communication strategies focused on creating emotional bonds. The results also suggest new research avenues aimed at analysing the dynamics between sustainability, customer experience, and loyalty building. Understanding these relationships can help identify the strategic factors that underpin competitive success in the hospitality sector.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by Ethics Committee of Instituto Superior de Gestão/CIGEST (Reference: CIG_0010.12/2015). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

RR: Data curation, Software, Investigation, Visualization, Conceptualization, Writing – original draft, Project administration,

Writing – review & editing, Validation, Methodology, Supervision, Formal analysis. SD: Conceptualization, Investigation, Resources, Writing – review & editing, Project administration, Writing – original draft, Supervision, Visualization, Formal analysis.

Funding

The author(s) declare that no financial support was received for the research and/or publication of this article.

Acknowledgments

CIGEST – Management Research Center, Lisbon, Portugal.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that no Gen AI was used in the creation of this manuscript.

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Appendix

Appendix A. Survey items used in the study

All items were rated on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree).

Perceived sustainability practices (Almeida et al., 2025; Poudel et al., 2014).

Social dimension

- The hotel encourages guests to learn about the region's culture.
- The hotel facilitates communication between guests and the local community.
- The hotel contributes to the preservation of regional culture.
- The hotel promotes visits to historical sites in the region.

Environmental dimension

- The hotel promotes nature conservation in the region.
- The hotel helps protect the surrounding natural environment.
- The hotel encourages the adoption of sustainable environmental practices (e.g., recycling).
- The hotel supports wildlife protection and their natural habitats.
- The hotel encourages the conservation of natural areas in the region.

Economic dimension

- The hotel contributes to the region's economic development.
- The hotel helps improve the standard of living of local people.
- The hotel attracts additional investment for local businesses.
- The hotel is important for the development of local infrastructure.
- The hotel increases investment opportunities for local residents.

Customer loyalty (Martinez et al., 2014; Suárez et al., 2007)

- This hotel will be my choice in the coming years.
- If someone asked for my opinion, I would recommend this hotel.
- I make positive comments about this hotel to family and friends.
- This hotel is always my first choice.
- Switching from this hotel would be costly in terms of time and money.
- It is very likely that I will stay at this hotel again in the future.
- This hotel will always be my choice when visiting this region.

Return intention (Rodrigues et al., 2024; Mason and Paggiaro, 2012)

- When I return to this region, I intend to stay at this hotel.
- If I visit this region again, I will definitely choose this hotel.
- I would not hesitate to return to this hotel in the future.