
The Evolution of Green Certification on Sustainable Travel Behaviours: Insights into Tourists Consciousness and Industry Support.

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Sustainable tourism has emerged as a strategic national priority, particularly within Oman's transition under Oman Vision 2040. This study investigates the determinants of tourists' sustainable travel behaviors in the tourist sites of Al Dakhiliyah Governorate, Oman where a total of 391 responses were collected. The research model evaluates the effects of tourists' awareness of green certifications, clarity and accessibility of sustainability information, and environmental values on sustainable travel behavior. Further, the model assesses the trip purpose moderates the relationship between environmental values and sustainable travel behavior. Empirical results demonstrate that clarity of sustainability information and tourists' environmental values significantly predict sustainable behaviors. Conversely, tourists' awareness of eco-labels alone does not significantly influence behavior, suggesting that awareness without contextual comprehension or credibility evaluation is insufficient to drive behavioral change. This reflects the widely documented attitude-action gap in sustainable tourism literature, where conceptual familiarity does not necessarily translate into responsible action. However, tour operator support for green certifications mediates the relationship between awareness and behavior, indicating that industry support plays a crucial role in transforming intent to actual sustainable practice. In addition, results confirm that the effect of environmental values on sustainable behavior is stronger among leisure travelers as compared to business travelers. This study contributes theoretically and practically by demonstrating that sustainability behavior is not solely shaped by individual consciousness but also by contextual support mechanisms. Insights offer implications for policymakers, destination managers, and tourism stakeholders to design targeted sustainability communications and industry interventions to advance sustainable tourism development in Oman.

Keywords— Environmental values, Green certification, Sustainable travel behaviours, Sustainable tourism, Value-Belief-Norm (VBN) Theory

I. INTRODUCTION

The tourism industry is a significant part of a country's economic development where it was one of the largest contributors to the global economy, contributing 10.4% of the world's GDP and providing 10.3% of worldwide employment (World Travel and Tourism Council, 2023). Significant interest in sustainability emerged in the global tourism sector, especially in developing tourism destinations such as Oman. However, the rise in popularity comes at a great environmental price. In response to the increasing awareness and concerns about tourism's environmental quality, green certifications and eco-labelling have emerged as strategies that apply pressure to embrace sustainable practices and facilitate environmentally responsible travel behaviors (Moon, 2023). Examples of eco-labels include Green Key, LEED, and EarthCheck, which represent voluntary environmentally friendly certifications that attempt to encourage sustainability in hospitality operations. This is accomplished by promoting the idea that eco-labels would help in providing tourists with appropriate guidance towards sustainable practices, while influencing service providers to practice environmentally responsible behaviors. Touloun and Eddali (2023) suggested that contextual determinants influenced tourists' environmentally responsible behaviors, and therefore green certification and eco-labeling are at the forefront of encouraging tourism sustainability, while promoting environmentally responsible behaviors among tourists.

Consistent with Oman Vision 2040 and the National Tourism Strategy, sustainable tourism is identified as a primary pillar for developing responsible tourism that is conducive to economic diversification, environmental stewardship, and social and cultural preservation (Ministry of Heritage and Tourism, Oman, 2022). Oman's Vision 2040 and its commitment to the United Nations Sustainable Development Goals (SDGs) indicate that it is addressing sustainability and environmental protection. Al-Azri et. al. (2024) noted the role of public-private partnerships in sustainable tourism, but they did not empirically explore the specific ways that certified lodging and related industry practices influence tourists. In the Al Dakhiliyah Governorate in Oman, despite a rich natural and cultural endowment, a new influx of tourist activity raises the fundamentals about the implementation of sustainable policies and tourist behavior on the ground. Understanding the drivers of sustainable travel decisions in this context is central in bridging the policy to the practice gap. Thus, this study was conducted in Al Dakhiliyah Governorate to investigate the relationship between tourists' awareness of green certifications, access to sustainability information, and underlying environmental values including industry support in the formation of sustainable travel behavior.

II. LITERATURE REVIEW

A. Theoretical Background

An integrated theoretical framework founded on two established behavioral theories, namely the Value-Belief-Norm (VBN) Theory and the Theory of Planned Behavior (TPB), serves as the underlying theories for this study. This theoretical perspective encompasses both internal motivations and external constraints that impact tourists' decision-making processes where it complements each other in providing an integrated account of the psychological and contextual determinants of sustainable travel behavior. Developed by Stern et al. (1999), the Value-Belief-Norm Theory is a psychological approach to understanding environmentally sustainable behaviors rooted in personal values that generate beliefs and moral norms. This theory is most relevant when discussing sustainable tourism because the behavior tends to be discretionary and based more on internalized environmental values than on the external enforcement of sustainability behaviors. In this research, common environmental values held by tourists (e.g., concern for nature, concern for future generations, sustainability) act as predispositions that influence their travel decisions. For example, Han (2021) found that individuals have an ecological awareness and demonstrate environmentally sustainable behavior (e.g., choosing destinations or services with a green certification) when they strongly identify with biospheric values. Similarly, Wang et al. (2023) determined that biospheric, altruistic, and collectivistic values influence both explicit and implicit environmental attitudes, which in turn influenced personal norms and engaged intent regarding green hotel selection. Another important point is that the awareness of green certification and the availability of sustainability information can be viewed as creating beliefs about the environmental consequences of tourism, which in turn activate personal norms to encourage responsible behavior. Thus, VBN theory presents a pathway from value orientation to sustainable travel behavior, explaining the reasons behind tourists' decisions. However, the VBN theory does not articulate whether or not situational, or external, factors might facilitate or constrain behavior. Therefore, an additional underlying theory for this study that is complementary to VBN is the Theory of Planned Behavior. Introduced by Ajzen (1991), the Theory of Planned Behavior recognizes that intentions on their own do not always produce behavior. The Theory of Planned Behavior suggests that an individual's behavior is determined by three broad factors: (i) their attitude towards the behavior, which might entail believing that sustainable travel is good for the individual, society and/or the environment; (ii) subjective norms, or the perceived pressure to act sustainably; and (iii) perceived behavioral control, which is the individual's perception of their ability and opportunities to enact sustainable behavior. These factors influence behavioral intention, which is assumed to lead to behavior when the intention is strong enough and the behavior is perceived as feasible. The Theory of Planned Behavior is important for gaining an understanding of the external and situational context of sustainable travel behavior, for example, even if a tourist holds strong pro-environmental values (as discussed by VBN), they may be unable to act on them if sustainable options are not available, visible or affordable. Hence, this is where tour operator support becomes important to assist tourists' perceived control and to minimize the intention-behavior gap. Tour operators can support tourists' pro-environmental behavior if the operators visibly promote or assist with their certified green services. Also, trip characteristics such as purpose, trip duration, desired group size may moderate intention-behavior relationship; for example, a solo traveler on a short trip may have more flexibility to select sustainable options than a family on an all-inclusive tour with limited choice or to influence options. Thus, applying VBN theory to understand why individuals exhibit a desire for sustainable behavior and TPB to understand whether they can exhibit sustainable behavior allows a full spectrum understanding of sustainable travel behavior. Using VBN theory, this research allows the study's aim to trace the moral and value-driven roots of sustainable travel behavior, whereas TPB offers an understanding of the situational and cognitive processes that may enable or inhibit that behavior. This theoretical approach ensures the study is not merely investigating surface level associations between variables, but leaning into the psychological, informational and situational pathways that may support or inhibit environmentally sustainable behavior from the perspective of tourists. As Zhao et al. (2022) highlighted, using VBN and TPB combined produces a strong predictive model for the intention to participate where environmental values and pro-environmental attitudes were mediators through subjective norms.

B. Sustainable Travel Behavior

Sustainable travel behavior describes the choice and behavior of tourists that reduces harm to the environment, socio-culture, and culture, while generating positive benefits for local communities, economies, and ecosystems (Yin, 2024). Sustainable travel behavior reflects a larger conceptual framework whereby travelers actively participate in the preservation of natural and cultural resources and engage in socio-economic development, while engaging in travel themselves. Tourist behaviors and experiences can have an enormous influence on their respective host communities and destinations. Accordingly, tourists' activities could also create citizens' dependence on tourism income, ecosystem degradation, or social disruption (Almuhri and Al-Azri, 2019). Sustainable travel behavior covers multiple dimensions such as environmental awareness, ecological awareness, respect for local culture, economic consideration, and actions that demonstrate responsiveness to sustainable tourism. Engaging in environmentally sustainable travel behavior involves reduction in ecological footprints, using eco-friendly or certified green accommodations such as lodges, green hotels, and green resorts (Font and Hindley, 2017). Choosing low emission transportation such as electric vehicles or the use of public transportation also contributes to reducing carbon emissions. Furthermore, resource conservation behaviors which tourists can engage in, such as reuse of linens, turning off lights, or air conditioning units when not used, and limited use of water resources cumulatively demonstrate a commitment to utilizing energy resources and water sustainably. Appropriate waste management is important, as tourists refraining from using single-use plastics, taking reusable containers with them, and joining in recycling efforts can all help alleviate the issue of solid waste being produced (Miller et al., 2010). Another key factor of sustainable travel is cultural sensitivity, which involves

respecting the traditions and customs of local people that contribute to maintaining cultural authenticity and protecting the relationship between tourists and host communities (McKercher & Du Cros, 2012). Sustainable economics is encouraged when visitors eat in local cafes, go to craft stores and participate in community-based tourism which can ensure that money generated from the industry goes directly back to the local residents. In addition, not taking advantage of the commercial service sector (such as with aggressive bargaining or engaging in unethical labor or environmental conditions) can ensure fair wages and ethical interactions with local communities (Ashley et al., 2000; Jamieson et al., 2004). The fostering of sustainable travel habits is crucial in order to reduce the harmful environmental and social impacts of tourism. For tourists, switching from a passive transport mode to an active transport mode such as walking or cycling for short distances allows the reduction in carbon footprint while contributing positively to personal well-being (Becken, 2019). Responsible wildlife tourism, which involves keeping a reasonable distance from the species involved and not feeding or disturbing them, is an important form of biodiversity protection. In addition, choosing alternative or developing destinations can relieve overtourism pressures from popular attractions, while potentially increasing distribution of economic benefits for balanced, sustainable tourism.

C. Ecolabels and Green Certifications in Tourism

Green certifications and eco-labels are the frameworks for the assessment of sustainable accommodation practices and responsible tourism. They make it easier for the tourists to recognize eco-friendly choices and thus, to adopt environmentally friendly actions and supports the preservation of natural and cultural resources in the ecotourism sector (El Moslem Badr, 2022). Bozdaglar's (2023) research presented that the tourism certification programs based on sustainability have a very good influence on sustainability performance since they have been very effective in minimizing the negative impacts on the environment, increasing the participation of the stakeholders, and improving waste management practices. Hence, they are powerful instruments to promote sustainability practices and shape responsible travel behaviors in tourism. During the last four decades, the number of ecolabels like Blue Flag, Green Key, Green Globe, and Biosphere Sustainable has increased, and the total number of certification programs has already surpassed 200 worldwide, which includes all segments from accommodations, tour operators, and destinations to restaurants (Zhao et al., 2022). The Blue Flag award in Italy led to increased domestic arrivals for up to three seasons (Cerqua, 2017). Capacci et al. (2015) stated that Blue Flag certification had a major impact on the travel behavior of foreign tourists.

D. Awareness of Eco-Labels

This implies the degree of tourists' awareness and comprehension of eco-labels denoting sustainability in the tourism and hospitality industry. It plays an integral role as the first step in nurturing eco-friendly decision-making among tourists. The awareness of eco-labels is a basic condition for their effectiveness whereby for tourists to pay attention with sustainability credentials, they have to be informed about the existence of such labels. Tiago et al. (2021) suggested that the better the knowledge of eco-certifications, the higher probability for tourists to choose eco-friendly accommodation and take part in sustainable practices, such as reducing energy use and waste. This consciousness makes them aware of the positive environmental and social benefits thus, they get motivated to act responsibly. Besides, it creates an awareness of guilt, leading to the tourists to behave in a sustainable manner when tourists understand the reason for their existence (Han and Kim, 2010). Penz et al. (2017) pointed out that consumers often rely on trustworthy authorities to certify and label products. However, while eco-labels can be useful, they may not be enough on their own. Their success relies heavily on better visibility and focused educational efforts to build awareness, recognition, and trust among travelers. For instance, environmentally conscious tourists might not think about sustainability when booking holidays because they simply do not know about the labels or understand their meaning. Therefore, El Moslem Badr (2022) suggested that it is crucial to implement programs for the public's awareness of environmental issues, thus, nurturing the right tourist behaviors. Therefore, the following hypothesis is proposed: Hypothesis 1: Tourists' awareness of green certification/eco labels is positively related to their sustainable travel behaviors.

E. Clarity of Sustainable Information

The clarity and transparency of eco-label and green certification information is a major factor in the development of sustainable tourist behavior. The tourism industry classifies sustainable information as a presentation of data that is clear, reliable, and easily usable which encourages responsible travel practices with the least possible negative impacts on nature and culture. Such information may comprise the availability of eco-friendly places to stay, local conservation programs, waste management initiatives, and sustainable transportation options (Gomes & Lopes, 2023). When this information is communicated clearly, it empowers tourists to select their actions in accordance with the principles of sustainable development. Aman et al. (2021) argued that tourists who are well-informed are more likely to adopt the behaviors that benefit the quality of life, lessen the environmental impact, and promote the sustainability goals globally. This means that the provision of sustainability information in an explicit manner, especially if it is connected to trustworthy eco-labels, can be a motivating factor for the transforming of environmental values into practical behaviors.

Effective eco-label communication not only conveys environmental credentials but also provides verifiable and trustworthy information about tourism services' sustainability performance. Research has indicated that both accessible and organized sustainability information significantly impacts tourist choices, enabling travelers to select eco-friendly alternatives (Gomes and Lopes, 2023). Research investigating eco-label perceptions, environmental knowledge, and pro-environmental behavior was conducted by Težak Damijanić et al. (2023) and they agree that clear communication of certification details allows tourists to develop sustainable intentions that are acted upon at the behavioral level. In contrast, insufficient clarity may cause confusion, misinterpretation, or simply disregard of sustainability labels, undermining their whole purpose. In practice, clarity is more involved than simply saying eco-label; it requires transparent criteria, a standardized format, and avoiding technical

jargon that may alienate or confuse the tourist. Without it, tourists might discount eco-labels as mere marketing fluff, and especially relevant in areas with rampant greenwashing, thus compromising the label's trustworthiness and reducing the intended behavioral impact on tourists. Accordingly, clarity incorporates the information aspect of eco-labels and additionally converts it into a trust mechanism.

The rise in the institutionalization of sustainability commitments reinforces the need for clarity in any certification information. Providers of accommodation, specifically, have incorporated sustainability certifications in their operational commitments to minimize the environmental impact and demonstrate responsible tourism (Velaoras et al., 2025). Certifications will be effective if they clearly communicate the scope, validity, and environment benefits to potential visitors. Tourists are more willing to engage in sustainable travel when provided clear, credible, sustainability information related to their destinations (Gomes and Lopes, 2023). Evidence from travel platforms and user interface demonstrated that clarity is paramount. The travel platforms that present labels and scores regarding sustainability-related controls such as carbon footprint and eco-certified scores lead the tourists' decisions toward greener destinations (Banerjee et al., 2024). Thus, clarity of eco-label/certification communication is important driver of behavioral change towards sustainable tourism. **Therefore, based on the reviewed literature, the following hypothesis is proposed:**

Hypothesis 2: Clarity of eco-label/green certification information positively influences sustainable tourist behaviors.

F. Environmental Values

Environmental values, which encompass intrinsic beliefs concerning the protection, preservation, and stewardship of nature play a role in influencing on tourists' behaviors. Tourists with strong biospheric or altruistic values consider eco-labels and sustainability claims as more than external indicators, but instead as genuine reflections of their own values, and that encourages them to purposefully engage in pro-environmental travel behaviors (Wang et al., 2023). The newer extensions of the Value-Belief-Norm (VBN) theory adds to this connection, providing strong evidence for environmental values being essential for predicting sustainable behavior in tourism. For example, a study of agritourism concluded that values such as environmental benefits and harmony with nature positively predicted intentions to behave sustainably in tourism, and this was mediated through attitude and subjective norms (Zhao et al., 2022). Likewise, research conducted in Northern Cyprus added support for VBN by showing that biospheric values positively impacted awareness of tourism sustainability into socially engaged behaviors, mediated through environmental knowledge and a strong eco-destination image (Alashiq and Aljuhmani, 2025). Empirical studies focus on protected areas have also found that tourists with biospheric values are likely to develop pro-environmental personal actions, such as waste reduction and conservation compliance (Sharma and Gupta, 2020). It is, therefore, proposed in this study that:

Hypothesis 3: Tourists' environmental values positively influence their sustainable travel behavior.

G. Tour Operator Support

In the tourism sector, tour operators play an important role in strengthening green certification by engaging with sustainable practices and promoting green initiatives. Their participation is important because it increases credibility to sustainability initiatives and facilitates compliance with established environmental performance standards. Tour operators' involvement in the promotion and facilitation of sustainable tourism practices involves supporting popular green certification programs, disseminating valid and easily navigable knowledge regarding eco-friendly alternatives, embedding sustainability criteria in their service delivery, and engaging with local communities and stakeholders to ensure responsible tourism development.

Tour operators are urged to adopt sustainable practices and certifications, including the Global Sustainable Tourism Council's Sustainable Tourism Criteria, as a means of supporting green certification. This trend reinforces responsible travel habits and potentially strengthens sustainability across tourism (Maniktala and Sharma, 2023). Anderson et al. (2013) showed there was a strong interest among tour operators in green certification, with a high percentage of operators indicating an interest in integrating eco-certification in their service. Tour operators are the key intermediaries in the tourism value chain and able to promote sustainable practices and develop environmental standards. Bozdaglar (2023) highlighted that tourism operators with eco-certifications indicated that they made significant improvements to their sustainability performance with evidence of measurable improvements in areas including energy use, waste, and

Espinero and Becken (2014) discovered that eco-labels have greater impact on tourists' decision-making when they are actively promoted or endorsed by tour operators. The endorsement acted as a medium of credibility and trust and encouraged tourists to see certified services as more trustworthy and environmentally conscientious. Likewise, Font et al. (2021) noted that when tour operators used or embedded these eco-certifications into their services and signified a commitment to sustainability through communication and marketing, it encouraged assisted tourists to select eco-friendly options.

Kim and Thapa (2018) also concurred the effectiveness of intermediaries or travel agents, in influencing tourists' environmentally responsible attitudes. Intermediaries reinforced pro-environmental messaging through verbal references, visual materials, and emotional content that helped tourists bridge sustainability with personal values and experiences. These studies imply that the influence of eco-labels is significantly enhanced when tourism operators and intermediaries actively communicate their relevance. Endorsing eco-labels can provide a way to close the gap between tourists' awareness of green certifications and that awareness translating into actionable sustainability behavioral change. Tour operators function as gatekeepers and influencers in tourist decision-making where if green certifications are promoted, explained, or incentivized, tourists are more likely to trust and act on them. Hence, the proposed hypothesis:

Hypothesis 4: Tour operators support mediates the relationship between tourists' awareness of green certifications and their sustainable travel behaviors.

H. Trip Characteristics

Trip characteristics such as trip purpose (leisure, business, pilgrimage), duration (short break versus longer stay), travel party (solo, family, organized group), type of accommodation (hotel, eco-lodge, homestay), mode of travel (private car, public transport, and flight), and budget are situational characteristics that facilitate or constrain the opportunities for sustainable behaviors while traveling. Environmentally conscious tourists would be able to demonstrate their values more easily during a long self-organized trip than a short, tightly scheduled, packaged group holiday where options are pre-determined. Empirical and theoretical work in tourism and environmental psychology supports the logic that characteristics of the trip, and other situational factors, impact the values intentions to action (Cao, 2022).

Research has demonstrated that the same underlying environmental values result in different levels of behavioral compliance depending on trip context (Bursa et al. 2022). For example, studies of sites located in ecotourism destinations or protected areas report travelers exhibiting more conservation-compliant behavior when tourists spent more time at a destination, experienced a type of place attachment, and the trip emphasized educational tourism (e.g., waste reduction or trail compliance). On the contrary, short visits, time pressures, and pre-packaged trips limited tourist participation in their choices of sustainable options (Luong, 2023; Zhang, 2024).

Trip purposes, like business travel, generally limit options and time, thus reducing pro-environmental behavior even in those with strong sustainability values. Likewise, group types, like family travel or travel in larger groups, often have additional logistical constraints (e.g., childcare, other preferences) that may inhibit pro-environmental behavior. Conversely, travelers on leisure trips have more flexibility in choosing eco-certification services and behaviors that reduce their impact. Thus, trip purpose whether it is business or leisure may either weaken or enhance the power of environmental values on sustainable behaviors (Vicente, 2024). However, selecting eco-certified accommodations or taking low carbon transport often comes at an additional cost or effort. When consumers are constrained by budget or availability (especially for peak travel seasons or in remote places), environmental values may not translate into behavior. Research has found that when sustainable options are provided at a reasonable rate and are affordable and convenient, tourists with pro-environmental values are more likely to adopt it. However, if those sustainable options are too expensive, or not as convenient, tourists may not adopt it, thus the relationship between values and behavior weakens. This is consistent with the Theory of Planned Behavior which posits cost and availability influences the way individuals act on their intentions (Deng et al., 2024). Therefore, the proposed hypothesis: Hypothesis 5: The positive relationship between tourists' environmental values and their sustainable travel behaviors would be stronger for leisure trips as compared to business trips.

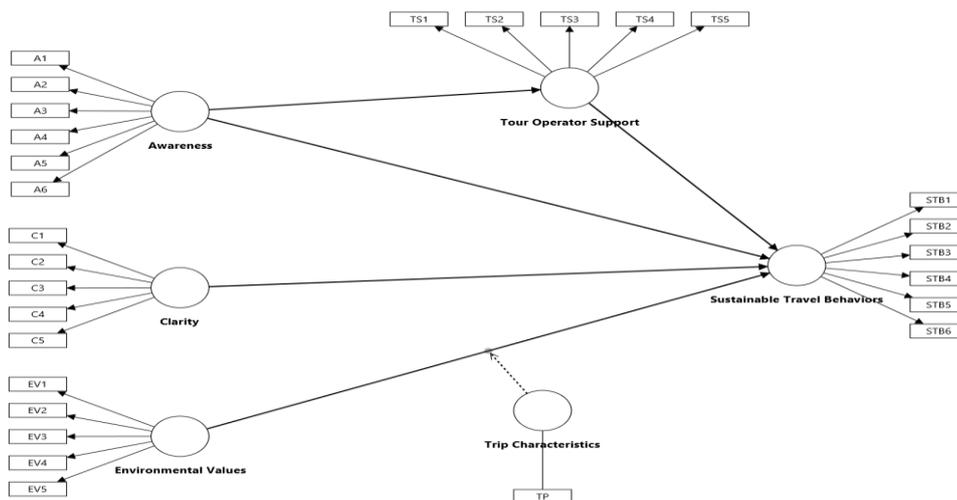


Figure 1: Research Model

III. METHODOLOGY

The adopted methodology for this study follows a quantitative, cross-sectional research design focusing on 391 tourists visiting the tourist sites in Al Dakhiliyah Governorate of Oman. This governorate was selected as the study location because it is one of Oman's prominent historical and cultural governorates in Oman. Adding to it is the city of Nizwa which is located in the governorate, was once the nation's capital and a hub for Islamic studies and commerce, hence, the governorate is home to numerous heritage landmarks, positioning it as a key tourist destination in the country. Data collection involved administering surveys to tourists using the purposive sampling approach, a non-probability sampling technique, to select participants who met specific inclusion criteria directly relevant to the research objectives. This approach ensured that the sample consisted of individuals with the necessary characteristics and knowledge to provide meaningful insights aligned with the study's focus.

A. Respondents Profile

The total sample of 391 respondents was largely represented by those between the ages of 30-39 years which consists of 28.6%, followed by 24.8% of respondents below 25 years, 17.6% the age of 40-49 years, 16.1% aged 26-29 years, and lastly respondents 50 years of age or older with 12.8%. In terms of educational attainment, the largest group of respondents had

attained a Bachelor's Degree followed by those whose highest level of education was High School education or lower (22.3%), those who had obtained a Master's Degree (22%), and those who had attained a Doctorate Degree (9.7%). The majority of respondents, 69.8%, stated that their primary reason for travelling was for leisure and the remaining 30.2% was business-related travel. As for duration of stay, approximately 49.4% of respondents reported staying for 3-7 days, followed by 25.8% indicating they were there for more than 7 days, and 24.8% indicating that they were for less than 3 days. Therefore, the predominant duration of stay among the sampled tourists is within the 3 to 7 days range, which represents a sizeable number of visits.

B. Common Method Bias

The variance inflation factors (VIFs) higher than 3.3 (Kock, 2015) in the model signify the existence of a common method bias. However, as reflected in Table 1, the VIFs obtained from the full collinearity test were all below the 3.3 threshold, suggesting that common method bias was not an issue.

Table 1: Full Collinearity Statistics (VIF)

Variable	A	C	EV	STB	TS	TP
VIF	1.895	1.399	1.644	2.044	2.229	1.012

Note: A = Awareness of Eco Labels

C = Clarity of Sustainable Information

EV = Tourists' Environmental Values

STB = Sustainable Travel Behaviors

TS =

Tour Operator Support

TP = Trip Purpose

C. Measurement Model

The PLS-SEM approach analysed the measurement model for construct reliability and validity. As shown in Table 2, the Composite Reliability (CR) values range from 0.927 to 0.941, all above the acceptable level of 0.700, suggesting strong internal consistency for each item measuring each latent construct. Convergent validity of the constructs were assessed using factor loadings and Average Variance Extracted (AVE). According to Hair et al. (2022), standardized factor loadings should be at least 0.500 but preferably above 0.700. The results in Table 2 indicate that all factor loadings are greater than the threshold of 0.700. Further, for Average Variance Extracted (AVE), Hair et al. (2022) suggested that there is evidence of convergent validity when its value is 0.500 or higher. This threshold indicates that the construct is explaining at least 50% of the variance for its indicators. Concurring, in Table 2, all AVE values are more than 0.500, hence the measurement model demonstrates acceptable validity and reliability.

Table 2: Measurement Model

Variable	Items	Loadings	CR	AVE
Awareness of Eco-Labels	A1	0.896	0.932	0.773
	A2	0.877		
	A5	0.874		
	A6	0.870		
Clarity of Eco-Labels	C1	0.887	0.927	0.718
	C2	0.880		
	C3	0.692		
	C4	0.882		
	C5	0.880		
Environmental Values	EV1	0.888	0.941	0.799
	EV2	0.889		
	EV4	0.916		
	EV5	0.881		
Sustainable Travel Behaviors	STB1	0.871	0.931	0.770
	STB2	0.884		
	STB5	0.878		
	STB6	0.878		
Tour Operator Support	TS1	0.863	0.928	0.764
	TS2	0.870		
	TS4	0.893		
	TS5	0.871		

Note: A3, A4, EV3, STB3, STB4 and TS3 were deleted due to low factor loading. C3 was not deleted because even though the loading was low but it is more than 0.5 and the AVE is more than 0.6.

Subsequently, discriminant validity is analysed to determine that two supposedly unrelated measures are not related to each other. This is established by using Heterotrait-Monotrait (HTMT) criterion (Henseler et al., 2015; Franke & Sarstedt, 2019). The HTMT values should be 0.90 or below and it is visible in Table 3, which shows the Heterotrait-Monotrait ratio (HTMT) test with all scores are less than the threshold level of 0.900. This gives confirmation that discriminant validity is established whereby each of the latent constructs are different to others and not related.

Table 3: Discriminant Validity

	Awareness	Clarity	Environmental Values	Sustainable Travel Behaviors	Tour Operator Support	Trip Purpose
A						
C	0.046					
EV	0.051	0.036				
STB	0.21	0.432	0.572			
TS	0.728	0.336	0.107	0.363		
TP	0.091	0.021	0.03	0.058	0.089	
TP * EV	0.035	0.053	0.015	0.102	0.081	0.023

Note: A = Awareness of Eco Labels C = Clarity of Sustainable Information
 EV = Tourists' Environmental Values STB = Sustainable Travel Behaviors TS = Tour Operator Support TP = Trip Purpose

D. Structural Model

Bootstrapping procedure was conducted to test the structural model and according to Hahn and Ang (2017) suggested that good criterion for testing the significance of hypothesis is a combination of criterions such as p-values, confidence intervals and effect sizes. For the direct effect hypotheses, only Hypotheses 2 and Hypothesis 3 are significant, and Hypothesis 1 is not significant. As shown in Table 4, Hypotheses 2 and Hypothesis 3 has p-values less than 0.05 and the confidence intervals bias corrected 95% also did not show any intervals straddling a 0 which confirms the hypotheses are significant. For Hypothesis 1, the p-value is 0.238 which is more than 0.05 and the confidence intervals bias corrected 95% shows an interval straddling a 0 which indicates that the hypothesis is not significant. Also based on the effect size f-square (f^2), it tells if the relationship is significant and explains the strength of the relationship between two variables. According to Cohen's (1988) category for direct effect size, $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ represent small, medium, and large effect sizes, respectively. Hence, from Table 4, effect size f-square (f^2) for Hypotheses 2 shows a medium effect size and Hypothesis 3 shows a large effect size but Hypotheses 1 has no effect size. Therefore, the finding in Table 4 confirms that Hypotheses 2 and Hypothesis 3 are significant and Hypotheses 1 is not significant.

Table 4: Hypothesis Testing Direct Effects

Hypothesis	Relationship	Std. Beta	Std. Dev	t-value	p-value	PCI LL	PCI UL	f^2
H1	A -> STB	0.033	0.047	0.714	0.238	-0.041	0.113	0.001
H2	C -> STB	0.331	0.038	8.755	0	0.265	0.39	0.197
H3	EV-> STB	0.558	0.035	16.047	0	0.498	0.612	0.653

Note: A = Awareness of Eco Labels C = Clarity of Sustainable Information
 EV = Tourists' Environmental Values STB = Sustainable Travel Behaviors

For mediation hypothesis, the indirect effect was tested by bootstrapping, as recommended by Preacher and Hayes (2008). Table 5 demonstrates that the H4 confidence intervals bias corrected 95% value does not straddle a 0 in between confirming significance for a mediation effect. Additionally, the p-value is less than 0.05, which also confirms the significance of this hypothesis. From Table 5 it also shows the effect size (f^2) of 0.031 which can be explained as a small effect size. This is based on Kenny (2021) proposed categories for mediation effect size where, $f^2 \geq 0.01$, $f^2 \geq 0.09$, and $f^2 \geq 0.25$ represent small, medium, and large effect sizes, respectively. Therefore, H4 is significant.

Table 5: Mediation Hypothesis Testing

Hypothesis	Relationship	Std. Beta	Std. Dev	t-value	p-value	PCI LL	PCI UL	f ²
H4	A -> TS -> STB	0.175	0.034	5.225	0.000	0.122	0.233	0.031

Note: A = Awareness of Eco Labels TS = Tour Operator Support STB = Sustainable Travel Behaviors

For the moderation hypothesis from Table 6, the result illustrated that the p-value is less than 0.05, the values of confidence intervals bias corrected 95% does not straddle a 0 and the effect size (f²) value of 0.038 shows a strong effect size according to Becker et. al. (2018) which states that values of 0.005/0.01/0.025 represents as weak/medium/strong effect size. Hence, the combination of findings shows that Hypothesis 5 is significant.

Table 6: Moderator Hypothesis Testing

Hypothesis	Relationship	Std. Beta	Std. Dev	t-value	p-value	PCI LL	PCI UL	f ²
H5	TP * EV -> STB	0.133	0.035	3.801	0.000	0.077	0.193	0.038

Note: TP = Trip Purpose EV = Tourists' Environmental Values STB = Sustainable Travel Behaviors

Figure 2 illustrates the moderating effect of trip purpose on the relationship between tourists' environmental values and their sustainable travel behaviors. The interaction plot shows a positive association between tourists' environmental values and their sustainable travel behaviors for both business and leisure travellers. However, the slope is slightly steeper for leisure travellers, indicating that higher environmental values translate into stronger sustainable travel behaviors among leisure tourists compared to business tourists. This pattern suggests that trip purpose moderates the strength of the positive relationship between tourist' environmental values and their sustainable travel behaviors with leisure trips having a stronger moderation effect as compared to business trips.

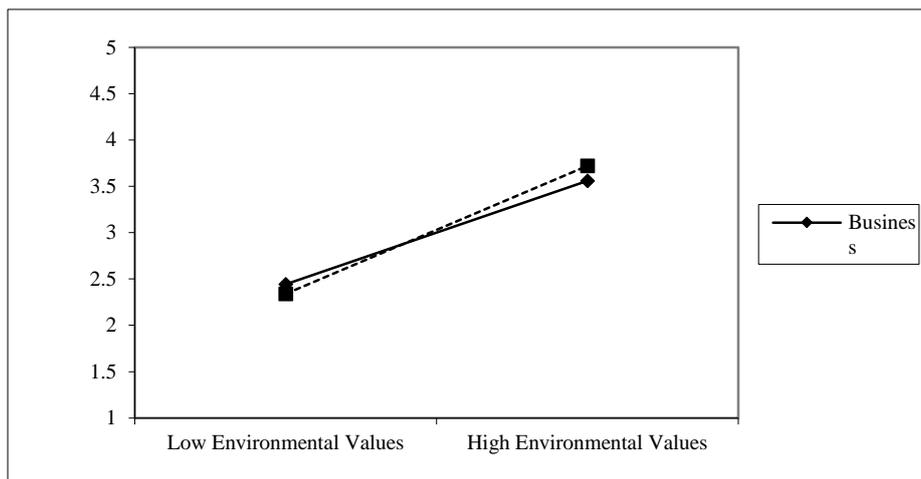


Figure 2: Simple Slopes Plot for Moderating Effect

The summary of the hypotheses can be seen in Table 7 which shows that all hypotheses are supported except for Hypothesis 1.

Table 7: Summary of Hypothesis

Hypothesis	Hypothesis	Decision
H ₁	Tourists' awareness of green certification/eco labels is positively related to their sustainable travel behaviors.	Not Supported
H ₂	Clarity of eco-label/green certification information positively influences sustainable tourist behavior.	Supported
H ₃	Tourists' environmental values positively influence their sustainable travel behavior.	Supported
H ₄	Tour operators support mediates the relationship between tourists' awareness of green certifications and their sustainable travel behaviors.	Supported
H ₅	The positive relationship between tourists' environmental values and their sustainable travel behaviors would be stronger for leisure trips as compared to business trips.	Supported

The path coefficient model of this study is illustrated as in Figure 3.

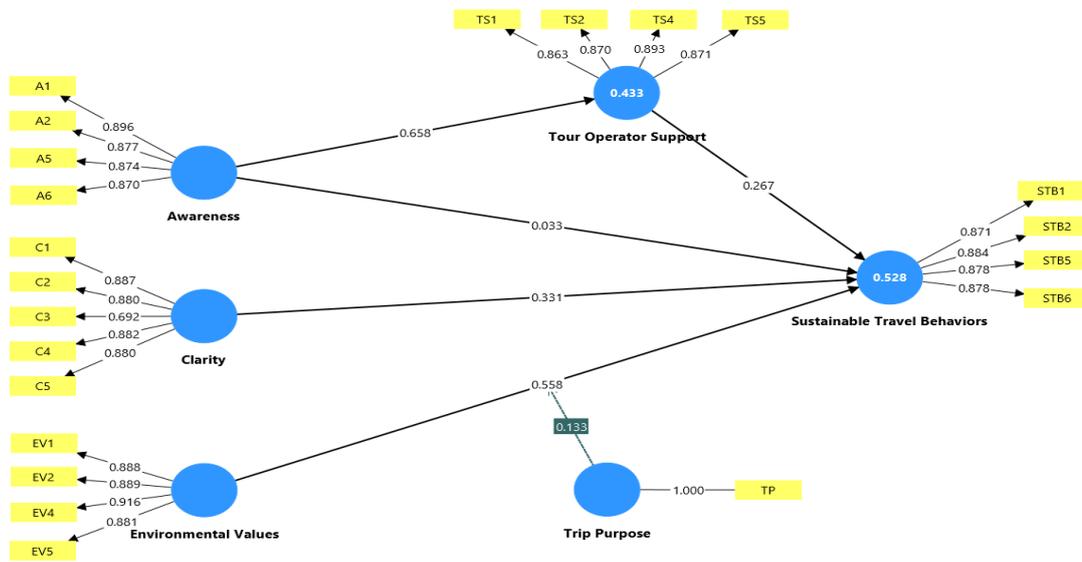


Figure 3: Path Coefficient Model

IV. FINDINGS AND CONCLUSION

The findings of the study demonstrate that sustainable travel behavior is influenced by a multifaceted interaction of cognitive, value-based, and institutional factors. Contrary to expectations, tourists' awareness of eco labels does not have a direct impact on sustainable travel behaviour. Tourists, even though aware of eco labels but do not fully understand what eco-labels mean or how to apply them to the travel process, will not translate their awareness into action. This reinforces the already established theory of the attitude-behaviour and knowledge-behaviour gaps in tourism (Juvan & Dolnicar, 2014). Awareness of sustainable travel options is low-level cognition, where tourists may know that eco-labels exist but lack the cognitive ability to interpret or apply this knowledge to travel decisions (Juvan & Dolnicar, 2014; McKercher et al., 2010). Thus, awareness is an indication only of recognition and not comprehension, with tourists often having limited situational motivation or capacity to integrate this information into travel decisions in a timely manner. Additionally, when awareness is further diluted due to other situational factors such as time constraints, inconvenience, and the notion of "vacation exceptionalism", which allows tourists to temporarily suspend their everyday moral standards (Juvan & Dolnicar, 2014; McKercher et al., 2010). This illustrates that reliance on awareness-focused sustainability campaigns will not produce measurable environmental behaviour change as informational exposure without sufficient interpretive depth or structural support will be ineffective.

In contrast the study results show that clear and understandable sustainability information influences behavior more than just the availability or presence of sustainability information. When tourists see identifiable and understandable eco-labels or green certification information, they are much more likely to act in a sustainable manner than when there is ambiguity or uncertainty about these sustainability cues. This finding aligns with signaling and information-processing theories, which posit that clear, credible, and easily interpretable signals lessen cognitive load and uncertainty when making decisions (Thøgersen et al., 2010). This distinction between awareness and clarity is analytically important while awareness may activate initial attention, clarity enables behavioral execution by transforming abstract sustainability claims into actionable knowledge.

Beyond informational factors, the findings support the idea that environmental values are an important predictor of sustainable travel behaviours, reinforcing value-based explanations of pro-environmental action. Tourists with higher levels of environmental value will be more likely to engage in sustainable behaviours because these behaviours conform to their internal moral self-concept and personal norms. Consistent to Value-Belief-Norm Theory, internalized values are a source of motivation for people such as in discretionary contexts where sustainable choices may involve trade-offs in cost or convenience (Stern, 2000). Unlike awareness, which is externally acquired and context-sensitive, environmental values are long-lasting, and they are tied to a person's identity, hence create greater consistency in behaviour. Therefore, this finding suggests that development of long-term values through education, social norms, and cultural narratives are important.

Crucially, the analysis reveals that awareness of green certifications becomes behaviorally meaningful only when mediated by tour operators' support. This highlights how critical the roles of tour operators in assisting the transition of sustainability knowledge into tourist behaviours by shaping the decision choices through curated itineraries, default options, interpretive

guidance, and the normalization of sustainable practices. This mediating effect explains why awareness alone fails to produce behavioral change, without structural facilitation, tourists may lack the opportunity, confidence, or convenience required to act on their sustainability knowledge. This finding aligns with Gössling et al., (2012) that sustainable behavior emerges from the interaction between individual motivation and contexts rather than from individual cognition alone.

The moderating role of trip characteristics further refines this interpretation by demonstrating that the influence of environmental values on sustainable behavior is contingent upon situational autonomy. It reveals that environmental values appear to be more influential in encouraging sustainable behaviours during leisure trips compared to business trips. Leisure travel provides more freedom and options regarding consumption decisions which allows tourists to express their values through their behaviors, while business travel is often constrained by organizational policies, standardized itineraries, and efficiency-driven priorities which limit value-behaviour consistency even for environmentally conscious individuals (Steg & Vlek, 2009).

In conclusion, these findings advance sustainable tourism theory by demonstrating that sustainable travel behavior is not a linear outcome of awareness, but a multi-layered process shaped by value internalization, informational clarity, and institutional enablement. The results offer clear strategic direction which requires moving beyond awareness-centric approaches toward integrated strategies that enhance eco-label communication quality, embed sustainability within tour operator practices, and cultivate environmental values that persist across travel experiences. Such an integrated approach is more likely to convert sustainability discourse into consistent, sustainable tourist behavior.

V. IMPLICATIONS AND STRATEGIES

The findings of this study carry important implications for tourism governance and practice in Oman, particularly in light of the country's strategic commitment to sustainable economic diversification under Oman Vision 2040 and its alignment with the United Nations Sustainable Development Goals (notably SDGs 8, 11, 12, and 13). The results collectively indicate that sustainable travel behavior cannot be effectively promoted through awareness-raising initiatives alone; rather, it requires an integrated policy and industry response that combines value formation, information quality, and structural enablement across the tourism system.

A. Tourism Policymakers

For tourism policymakers, this is a signal for the revision of communicating sustainability strategies because traditional awareness campaigns that focus primarily on increasing visibility of eco-labels are unlikely to generate behavioral change unless they are accompanied by measures that enhance interpretability, credibility, and relevance of those labels when tourists are making their decisions. To accomplish this, policymakers should put an emphasis on creating standardized, transparent, and eco-certification frameworks that are easily understood by tourists. This means reinforcing the national eco-certification schemes for lodgings, tours and attractions, while ensuring alignment with international standards to enhance trust and global recognition. Regulatory enforcement also requires the establishment of communication quality where tourists should receive clear and comparable messages concerning the eco-sustainability of their consumption patterns, thereby providing them with greater assurance about choosing sustainable products and services.

B. Tour Operators

Tourism stakeholders particularly tour operators should not consider sustainability an optional add-on but instead integrate sustainability as default choices in their offerings such as prioritizing eco-certified accommodations, promote local and low-carbon transport options, experience community-driven development projects and community-based tourism, share economic benefits with the local community, and to create a positive impact on the environment. Destination management organizations in turn can assist with this transition by providing financial incentives for operators to promote sustainable tourism practices, building capacity in operators and recognizing those that promote sustainability in a way that supports the marketplace and regulatory frameworks.

C. Destination Managers

Sustainable behaviours can be actively encouraged through effective design interventions that include clear signage explaining environmental impacts, providing visible sustainability certifications and guided information on how their behaviours influence the conservation outcomes. In addition, providing visitors with the infrastructure to make sustainable choices easy to identify is important to ensure that they choose sustainably. In the ecologically sensitive areas such as wadies, caves, deserts and coastal areas, destination managers need to employ interpretive communication to help tourists understand that sustainability has tangible consequences from their environmental responsibility action.

D. Service providers

Service providers such as hotels and accommodation, transport service, restaurants, attractions, and activity providers who are direct suppliers of individual tourism services should clearly communicate sustainability initiatives such as providing

information about energy efficiency measures, waste reduction efforts, and water conservation initiatives, and how guests can be involved in these programs. Service providers need to provide straightforward and credible information to guests about the importance of sustainable behavior and how guests can easily contribute. By fostering coordinated action across stakeholders, Oman can more effectively translate its sustainability ambitions under Vision 2040 into consistent tourist behaviors that support environmental protection, community well-being, and long-term destination competitiveness

VI. THEORETICAL CONTRIBUTION

The contributions of this research to the field of sustainable tourism research are conceptual because it provides an alternative mechanism-based and context-based explanation of behavior in sustainable travel. The data proves that people who know about green certification/ecolabel do not necessarily exhibit sustainable tourism behavior. This reinforces and extends the gap between knowledge and behavior in tourism which indicates that awareness should be viewed as a cognitive state not a behavioral state. It provides an alternative and more robust description of awareness than many previous studies, as it distinguishes between the clarity of sustainability information and awareness. This shows that the information available to consumers regarding sustainability can act as a trigger for their behavior if it is usable and interpretable by consumers and can be considered credible. This clarifies the use of signaling and information processing theories and identifies the clarity of information as an important explanatory mechanism which also supports the Value-Belief-Norm theory.

VII. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

There are several limitations to this study, each of which provides a clear opportunity for future research. For the first limitation, the cross-sectional nature of the survey used in this study limits the extent to which strong conclusions can be made regarding causal relationships between the various constructs, as these relationships were measured at one point in time only. Therefore, future research could examine how sustainability awareness, information clarity and environmental values develop and influence behavior through the travel decision-making process using longitudinal or experimental methods. Additionally, subsequent studies using experimental methods to isolate the causal impact of eco-label clarity and tour operator interventions would help confirm the extent to which these variables affect tourist behavior. A second limitation is that the reliance on self-reported sustainable travel behaviour can also introduce a social desirability bias and a gap between intention and actual behaviour. Future studies could use objective or behavioural measures, for example, booking records, on-site observations and/or experimental choice simulations, in order to enhance the validity of self-report measures of sustainable travel behaviour. Thirdly, this study only focused on Oman, which provides an insight into sustainability transitions driven by government policy, but may have limited validity when the findings are applied to destinations with different institutional, cultural or tourism development contexts. Therefore, further replication of this study across other mature mass tourism destinations and developing economies would provide evidence of the circumstances under which this proposed model is applicable.

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