

Ecological Consciousness and Sustainable Tourism Ecosystems: A Multi-Dimensional Analysis of Green Marketing Influence on Consumer Decision Pathways in Vietnam's Emerging Market Context

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Abstract: This research investigates the complex relationship between ecological consciousness, green marketing strategies, and sustainable tourism consumption behaviours within Vietnam's rapidly evolving tourism sector. Employing a sophisticated multi-dimensional analytical framework, the study examines how ecological awareness translates into sustainable decision-making pathways among Vietnamese consumers and international tourists in Vietnam's emerging market context. Through a comprehensive quantitative methodology utilizing structural equation modelling (SEM) with Partial Least Squares (PLS) approach complemented by fuzzy-set Qualitative Comparative Analysis (fsQCA), this research offers nuanced insights into the causal configurations that foster sustainable tourism ecosystems. Data collected from 427 respondents reveal that ecological consciousness significantly influences sustainable tourism choices, with green marketing serving as both mediator and moderator in this relationship. The findings demonstrate that environmental knowledge, perceived consumer effectiveness, and environmental concern constitute distinct yet interrelated dimensions of ecological consciousness that differentially impact consumer decision pathways. Green marketing emerges as a critical catalyst in translating awareness into action, particularly when aligned with cultural values and perceived authenticity. The research contributes to existing theoretical frameworks by proposing an integrated model of sustainable tourism consumption that incorporates both rational-cognitive and emotional-experiential factors. These findings offer valuable strategic implications for tourism stakeholders in Vietnam and comparable emerging markets seeking to harness ecological consciousness for sustainable development, while simultaneously addressing the theoretical gap concerning the contextual nuances of green consumption in non-Western settings.

Keywords- ecological consciousness, sustainable tourism, green marketing, consumer decision pathways, Vietnam

1. INTRODUCTION

The global tourism industry's extraordinary growth presents a profound paradox: whilst generating substantial economic opportunities, it simultaneously produces environmental challenges threatening the very ecosystems underpinning the industry. This tension manifests acutely in emergent economies such as Vietnam, where accelerated tourism expansion frequently conflicts with ecological sustainability objectives [1]. The imperative to reconcile economic advancement with environmental conservation has catalysed scholarly interest in ecological consciousness and green marketing strategies as facilitators of sustainable tourism ecosystems [2].

The nexus between ecological consciousness and sustainable tourism constitutes a domain of critical theoretical and practical significance. Environmental awareness has evolved from peripheral concern to central determinant of consumer behaviour across multiple contexts, including tourism [3]. Nevertheless, the pathways through which ecological consciousness translates into sustainable tourism choices remain incompletely understood, particularly within non-Western cultural contexts [4].

Extant literature exhibits significant limitations in conceptualising ecological consciousness within tourism

contexts. Conventional approaches have predominantly examined Western markets, creating a substantial knowledge deficit regarding how ecological values manifest in collectivist societies with distinct cultural paradigms [5]. Furthermore, the literature demonstrates conceptual fragmentation concerning green marketing mechanisms, with insufficient attention to mediating and moderating processes influencing sustainable consumption [6].

Vietnam presents a particularly compelling research context, experiencing remarkable tourism growth—approximately 26% annual increase in international arrivals between 2010-2016 [7]—whilst confronting escalating environmental challenges [8]. This tension renders Vietnam an ideal laboratory for investigating ecological consciousness in tourism consumption. Furthermore, existing models developed in Western contexts demonstrate questionable applicability to Vietnam's distinctive cultural landscape characterised by Confucian values and collectivist orientations [9].

This research addresses these theoretical gaps through a multi-dimensional model capturing the complex interplay between ecological consciousness, green marketing, and sustainable tourism choices. The investigation employs dual methodological approaches: structural equation modelling and fuzzy-set Qualitative Comparative Analysis to identify both linear relationships and complex configurational patterns.

The necessity of this research is underscored by Vietnam's Tourism Development Strategy, which explicitly identifies sustainable tourism as a strategic priority whilst acknowledging significant implementation challenges [11]. Vietnam's tourism sector faces a critical inflection point requiring integration of ecological considerations into development frameworks [12].

This study makes significant contributions to theoretical understanding and practical application in sustainable tourism by addressing knowledge gaps concerning environmental awareness translation into consumption behaviour within non-Western contexts, offering evidence-based guidance for stakeholders seeking to foster sustainable tourism ecosystems in emerging markets.

2. FOUNDATIONAL THEORIES AND LITERATURE REVIEW

2.1 Foundational theories

2.1.1. Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) provides a foundational framework for understanding how individual attitudes and perceptions influence behavioural intentions and subsequent actions in environmentally significant domains. Originally developed by [13], the TPB postulates that behaviour is determined by intentions, which are themselves shaped by attitudes toward the behaviour, subjective norms, and perceived behavioural control. This theoretical framework has demonstrated considerable explanatory power in predicting pro-environmental behaviours across diverse contexts, including sustainable tourism consumption [10].

The TPB offers particular relevance to the study of ecological consciousness and sustainable tourism behaviours due to its capacity to account for both individual motivations and contextual constraints. As [14] articulate, environmental behaviours represent a complex amalgamation of self-interest and pro-social motives, a duality effectively captured by the TPB's integration of attitudinal, normative, and control factors. Applied to sustainable tourism, the theory suggests that consumers' decisions to engage in environmentally responsible travel behaviours derive from their attitudes toward such behaviours, their perceptions of social expectations, and their assessment of barriers and facilitators to action.

However, conventional applications of the TPB have been criticized for their primarily Western orientation, with insufficient attention to cultural variations in the relative importance of attitudinal, normative, and control factors [15]. In collectivist societies such as Vietnam, the influence of subjective norms may be particularly pronounced, reflecting the cultural emphasis on social harmony and group orientation [9]. Additionally, as [16] observe, the relationship between environmental attitudes and behavioural intentions may be moderated by cultural values that prioritize different aspects of the human-nature relationship.

Furthermore, the TPB has been critiqued for its limited consideration of affective dimensions, which play a crucial

role in tourism experiences and environmental decision-making [5]. Sustainable tourism behaviours involve not only rational calculations of costs and benefits but also emotional connections to places, cultures, and natural environments. As [17] argue, the emotional engagement with environmental issues represents a significant determinant of sustainable tourism behaviour that extends beyond the primarily cognitive orientation of traditional TPB models.

Despite these limitations, the TPB provides a valuable theoretical foundation for understanding the translation of ecological consciousness into sustainable tourism behaviours. However, as [18] suggest, the theory requires adaptation to account for the cultural specificities of different contexts and the emotional dimensions of environmental decision-making. This research employs the TPB as a guiding framework while addressing its limitations through the integration of value-belief-norm theory and culturally sensitive constructs relevant to Vietnam's emerging market context.

2.1.2. Value-Belief-Norm Theory

The Value-Belief-Norm (VBN) theory, developed by [19], offers a complementary perspective that addresses some limitations of the TPB by explicitly accounting for the role of personal values and moral norms in shaping environmental behaviours. The VBN theory proposes a causal chain linking values to beliefs about human-environment relationships, awareness of consequences, ascription of responsibility, and ultimately to personal norms that activate pro-environmental behaviours [20].

The VBN theory holds particular significance for understanding ecological consciousness and sustainable tourism by illuminating the moral and normative dimensions that underpin environmentally responsible travel decisions. As [18] demonstrate, tourists' sustainable behaviours often stem from deeply held values concerning environmental protection and intergenerational equity. These values activate personal norms that create a sense of moral obligation to minimize ecological impacts while travelling, even when doing so involves increased costs or inconvenience.

In the Vietnamese context, the VBN theory offers valuable insights into how traditional cultural values might influence environmental consciousness and sustainable tourism behaviours. As [4] observe, Vietnamese culture encompasses strong collectivist values and historical relationships with nature derived from agricultural traditions and philosophical systems such as Confucianism, Buddhism, and Taoism. These cultural elements potentially shape distinctive patterns of environmental values and beliefs that diverge from Western models, creating unique pathways to sustainable consumption.

However, the VBN theory has been criticized for insufficient attention to contextual factors that constrain or enable the expression of values through behaviour [21]. In tourism contexts, structural factors such as availability of sustainable options, price differentials, and information asymmetries may create significant barriers to translating environmental values into consumption behaviours. As [22] notes, tourists

frequently express environmental concerns without corresponding behavioural adjustments, suggesting a gap between values and actions that requires theoretical explanation.

Furthermore, while the VBN theory effectively captures the moralistic dimensions of environmental behaviour, it provides less insight into the strategic and instrumental motivations that also influence sustainable consumption. As [6] argue, consumers often engage in green purchasing not only from moral conviction but also from desires for status signalling, health benefits, or quality assurance. These multiple motivations create complex decision pathways inadequately captured by purely value-driven models.

This research utilizes the VBN theory as a complementary framework to the TPB, integrating moral norms and environmental values into a comprehensive model of ecological consciousness and sustainable tourism behaviour. By synthesizing these theoretical perspectives, the study addresses the multifaceted nature of environmental decision-making in tourism contexts, encompassing both instrumental and moral dimensions while accounting for the cultural specificities of Vietnam's emerging market environment.

2.2. Review of empirical and relevant studies

2.2.1. Ecological consciousness

Ecological consciousness represents a multidimensional construct encompassing cognitive, affective, and conative dimensions related to environmental awareness and concern. The concept has evolved significantly from early unidimensional models to more sophisticated conceptualizations that capture the complex psychological structures underlying environmental attitudes and behaviours [23]. This evolution reflects growing recognition that ecological consciousness comprises not merely knowledge about environmental issues but also emotional engagement with nature and perceived capacity to effect positive environmental change.

Empirical research has identified several distinct yet interrelated components of ecological consciousness. Environmental knowledge constitutes a foundational dimension, encompassing both abstract understanding of ecological principles and concrete awareness of environmental problems [24]. While knowledge alone rarely translates directly into behaviour, it establishes the cognitive foundation for environmental concern and action. As [25] demonstrate in their study of Chinese managers, environmental knowledge significantly influences attitudes toward environmental regulation and willingness to engage in corporate environmental responsibility.

Environmental concern represents an affective dimension of ecological consciousness, reflecting emotional investment in environmental quality and anxiety regarding ecological degradation [26]. Research consistently demonstrates that environmental concern predicts various pro-environmental behaviours, including green purchasing, conservation activities, and political engagement [27]. However, the

relationship between concern and action varies across cultural contexts, with stronger correlations typically observed in individualist societies compared to collectivist cultures [16]. Perceived consumer effectiveness constitutes a third critical dimension of ecological consciousness, capturing individuals' beliefs regarding their capacity to address environmental problems through their consumer choices [28]. This dimension bridges knowledge and concern with action by establishing psychological pathways through which abstract environmental values translate into concrete consumption behaviours. As [27] demonstrate, perceived consumer effectiveness mediates the relationship between environmental concern and green purchasing, explaining why some concerned consumers engage in environmental action while others remain passive despite similar levels of concern. In tourism contexts, ecological consciousness manifests in destination choices, travel modes, accommodation preferences, and on-site behaviours. [29] identify segments of environmentally conscious tourists who prioritize ecological considerations in their travel decisions, even accepting higher costs or reduced convenience to minimize environmental impacts. However, [5] find substantial cross-cultural variations in how environmental consciousness translates into tourism behaviours, with collectivist societies placing greater emphasis on normative influences compared to individual attitudes.

Research in the Vietnamese context reveals emerging ecological consciousness among urban consumers, particularly younger, educated demographics exposed to global environmental discourses [4]. However, as [30] observe, Vietnamese environmental attitudes often reflect distinctive cultural values concerning harmony with nature and collective responsibility, creating potentially unique manifestations of ecological consciousness that diverge from Western models. These cultural specificities necessitate context-sensitive approaches to measuring and theorizing ecological consciousness in Vietnam's tourism sector.

Despite extensive research, significant gaps remain in understanding ecological consciousness in non-Western contexts and its specific manifestations in tourism consumption. This study addresses these gaps by developing a culturally sensitive model of ecological consciousness comprising environmental knowledge, environmental concern, and perceived consumer effectiveness, examining how these dimensions influence sustainable tourism behaviours in Vietnam's unique cultural and economic context.

2.2.2. Green marketing strategies

Green marketing encompasses strategic approaches that integrate environmental considerations into marketing activities, including product development, pricing, promotion, and distribution [31]. In tourism contexts, green marketing manifests through eco-certification programs, sustainable branding initiatives, communications highlighting environmental credentials, and distribution strategies that

connect environmentally conscious consumers with sustainable tourism offerings [2].

Research demonstrates that effective green marketing strategies must balance instrumental and normative appeals, addressing both self-interest and altruistic motivations that drive sustainable consumption [32]. As [6] observe, green marketing messages prove most effective when they connect environmental benefits with personal advantages such as health, quality, or status enhancement. This finding holds particular relevance in tourism contexts, where sustainable offerings must deliver experiential value alongside environmental benefits to attract mainstream consumers beyond niche ecotourism markets [33].

Authenticity constitutes a critical dimension of effective green marketing in tourism contexts. Consumers demonstrate heightened skepticism toward environmental claims perceived as superficial or deceptive, a phenomenon [34] term "greenwashing." As [35] demonstrates, perceived greenwashing significantly diminishes consumer trust and purchase intentions regarding environmentally marketed products and services. This authenticity imperative creates substantial challenges for tourism enterprises seeking to communicate genuine environmental commitments without overwhelming consumers with technical information or certification details.

Green pricing strategies reveal complex consumer responses that vary across segments and contexts. While [33] find that environmentally conscious tourists often accept premium pricing for sustainable offerings, [36] identifies significant price sensitivity even among consumers expressing strong environmental values. This apparent contradiction reflects the multifaceted nature of tourism decision-making, where environmental considerations compete with budget constraints, convenience factors, and experiential objectives. As [2] argue, sustainable tourism marketers must carefully position environmental attributes within a broader value proposition rather than relying exclusively on ethical appeals that may activate price sensitivity.

Distribution represents a critical yet often overlooked dimension of green marketing in tourism contexts. As [37] observes, sustainable tourism offerings frequently face distribution challenges due to their location in environmentally sensitive areas with limited infrastructure or their operation by small enterprises with restricted marketing resources. These distribution barriers create significant obstacles to connecting environmentally conscious consumers with sustainable tourism products, necessitating innovative approaches to visibility and accessibility [12].

In the Vietnamese context, green marketing in tourism remains in an emergent stage, with variable implementation quality and effectiveness. [38] identify nascent green marketing initiatives in Vietnam's hotel sector, particularly among international chains and luxury properties targeting environmentally conscious segments. However, [8] observe significant gaps between environmental marketing claims and actual sustainability practices among Vietnamese tourism

enterprises, creating potential authenticity challenges that undermine marketing effectiveness.

Despite growing interest in green marketing for tourism, significant knowledge gaps persist regarding its implementation and effectiveness in emerging markets such as Vietnam. This research addresses these gaps by examining how green marketing strategies influence the relationship between ecological consciousness and sustainable tourism behaviours, considering both direct effects and moderating influences that shape consumer decision pathways in Vietnam's distinctive cultural and economic context.

2.2.3. Sustainable tourism behaviour

Sustainable tourism behaviour encompasses consumption choices that minimize negative environmental impacts while maximizing positive contributions to destination communities and economies [33]. This behavioural domain includes pre-trip decisions regarding destination selection, transportation mode, and accommodation choice; on-site behaviours such as resource consumption, waste management, and activity participation; and post-trip behaviours including advocacy, recommendation, and loyalty [39].

Research reveals complex determinants of sustainable tourism behaviour that extend beyond general environmental attitudes to include situational constraints, normative influences, and destination-specific factors [40]. While environmental consciousness predicts sustainable tourism intentions, the attitude-behaviour gap remains substantial, with many environmentally concerned tourists failing to translate their values into consistent travel choices [22]. This implementation gap reflects both contextual barriers such as availability, price, and convenience, and psychological factors including habit, perceived effort, and social norms.

Knowledge emerges as a significant yet insufficient precursor to sustainable tourism behaviour. [41] demonstrate that environmental knowledge frequently fails to transfer from home contexts to tourism settings, with even committed environmentalists often suspending sustainable behaviours while travelling. This "holiday exception" phenomenon indicates that sustainable tourism requires not merely general environmental knowledge but specific understanding of tourism impacts and mitigation strategies [40].

Social influence plays a particularly important role in sustainable tourism behaviour, especially in collectivist cultures. [10] identify subjective norms as significant predictors of intentions to select environmentally friendly hotels, with consumers influenced by the expectations of reference groups including family members, friends, and colleagues. These normative influences potentially hold heightened importance in Vietnam's collectivist cultural context, where individual decisions frequently reflect group expectations and social consensus [9].

Perceived behavioural control significantly influences sustainable tourism behaviour, with consumers more likely to make sustainable choices when they perceive such options as accessible, affordable, and effective [14]. This perception varies substantially across different aspects of tourism

consumption, with some behaviours such as towel reuse or local food consumption perceived as easily implemented, while others such as transportation choices face significant structural constraints [42].

In the Vietnamese context, sustainable tourism behaviour exhibits distinctive patterns shaped by cultural values, economic factors, and infrastructural constraints. As [30] observe, Vietnamese domestic tourists often demonstrate strong attachment to natural environments but may lack specific knowledge regarding appropriate environmental behaviours in tourism contexts. Furthermore, Vietnam's rapid tourism development has created structural conditions that sometimes inhibit sustainable choices, including limited availability of certified eco-friendly accommodations and transportation alternatives [12].

Despite extensive research on sustainable tourism behaviour in Western contexts, significant knowledge gaps persist regarding behavioural patterns in emerging economies such as Vietnam. This study addresses these gaps by examining how ecological consciousness and green marketing influence specific dimensions of sustainable tourism behaviour, including destination selection, accommodation choice, transportation decisions, and on-site activities, within Vietnam's unique cultural and economic environment.

2.3. Proposed research model

Based on the aforementioned theoretical foundations and empirical studies, this research proposes a comprehensive structural model that conceptualizes the relationships between ecological consciousness, green marketing strategies, and sustainable tourism behaviours in Vietnam's emerging market context. The model integrates elements from both the Theory of Planned Behaviour and Value-Belief-Norm Theory, while accounting for the distinctive cultural and economic characteristics of Vietnam's tourism landscape.

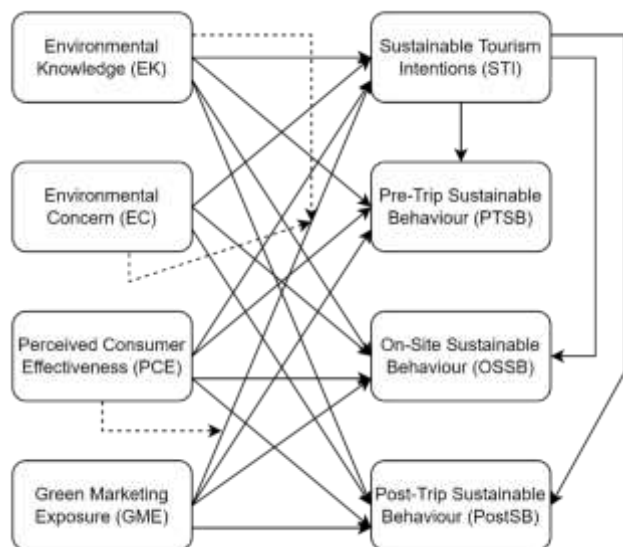


Fig.1. Proposed research model

The conceptual framework positions ecological consciousness as a multidimensional construct comprising three interrelated yet distinct components: environmental knowledge, environmental concern, and perceived consumer effectiveness. This multifaceted conceptualization aligns with recent theoretical developments that recognize the cognitive, affective, and conative dimensions of environmental awareness [23]. Environmental knowledge encompasses understanding of ecological principles, environmental problems, and potential solutions, establishing the cognitive foundation for sustainable decision-making [24]. Environmental concern represents the affective dimension, capturing emotional engagement with environmental issues and anxiety regarding ecological degradation [26]. Perceived consumer effectiveness constitutes the conative element, reflecting individuals' beliefs regarding their capacity to address environmental problems through their consumption choices [28].

These dimensions of ecological consciousness are hypothesized to influence sustainable tourism behaviour both directly and indirectly through the mediating mechanism of sustainable tourism intentions. This mediational pathway reflects the Theory of Planned Behaviour's proposition that attitudes influence behaviour through the intervening variable of behavioural intentions [13]. In this model, sustainable tourism intentions capture consumers' expressed plans to engage in environmentally responsible travel behaviours, including selection of eco-certified accommodations, participation in conservation activities, and minimization of resource consumption during travel experiences.

Green marketing strategies are conceptualized as both independent and moderating variables within the model. As independent variables, green marketing strategies directly influence sustainable tourism intentions and behaviours, reflecting marketing's capacity to shape consumer preferences and decisions [2]. As moderating variables, green marketing strategies influence the relationship between ecological consciousness and sustainable tourism intentions, potentially strengthening the translation of environmental awareness into behavioural intentions when marketing messages effectively activate latent ecological values [32].

The model distinguishes between functional and emotional green marketing appeals, recognizing that sustainable tourism marketing employs diverse approaches to influence consumer decisions. Functional appeals emphasize practical benefits such as resource efficiency, health advantages, and quality assurance, addressing instrumental motivations for sustainable consumption [6]. Emotional appeals activate moral norms, connection to nature, and altruistic values, engaging the affective dimensions of ecological consciousness identified in Value-Belief-Norm Theory [20]. By examining these distinct appeal types, the research investigates differential effectiveness of green marketing approaches across consumer segments and decision contexts. Sustainable tourism behaviour represents the dependent variable in the proposed model, operationalized through multiple indicators capturing pre-trip, on-site, and post-trip

behaviours. Pre-trip indicators include selection of environmentally certified accommodations, consideration of environmental factors in destination choice, and use of sustainable transportation options [33]. On-site indicators encompass resource conservation behaviours, participation in environmental activities, and proper waste disposal practices [39]. Post-trip indicators include advocacy for environmental protection, recommendation of sustainable tourism options, and loyalty to environmentally responsible tourism providers [10].

The model incorporates several control variables to account for potential confounding influences, including demographic characteristics (age, education, income), travel experience, and environmental values. These control variables enable isolation of the specific effects of ecological consciousness and green marketing on sustainable tourism behaviour, enhancing the model's explanatory power and practical relevance.

This integrated conceptual framework addresses several theoretical gaps identified in the literature. First, by conceptualizing ecological consciousness as a multidimensional construct, it moves beyond simplistic unidimensional models that fail to capture the complexity of environmental awareness. Second, by examining both direct and indirect effects of ecological consciousness on behaviour, it investigates potential explanations for the attitude-behaviour gap identified in sustainable tourism research [40]. Third, by positioning green marketing as both independent and moderating variables, it provides nuanced insights into how marketing interventions influence the translation of environmental awareness into sustainable consumption behaviours.

The proposed model is particularly relevant to Vietnam's emerging market context, where rapid tourism development creates both opportunities and challenges for sustainable practices. By examining how ecological consciousness manifests in Vietnam's collectivist cultural environment and how green marketing strategies influence Vietnamese consumers' tourism decisions, the research provides contextually specific insights that extend theoretical understanding beyond Western conceptual frameworks [4]. Furthermore, by employing a dual methodological approach combining SEM with fsQCA, the research identifies both linear relationships and complex configurational patterns that foster sustainable tourism ecosystems in Vietnam's distinctive economic and cultural landscape.

3. RESEARCH METHODOLOGY

3.1 Research Design and Approach

This investigation employs a quantitative methodology with cross-sectional survey design to examine relationships between ecological consciousness, green marketing strategies, and sustainable tourism behaviours in Vietnam. This approach enables rigorous statistical testing of hypothesised relationships whilst facilitating generalisation to broader populations [43]. The explanatory nature of this

research, which aims to establish causal relationships between constructs, necessitates the analytical precision afforded by quantitative methodology.

The research design incorporates both variance-based and configurational approaches to capture the multifaceted nature of the phenomena under investigation. Structural equation modelling (SEM) with Partial Least Squares (PLS) estimation examines linear relationships and tests mediating and moderating effects [44], whilst fuzzy-set Qualitative Comparative Analysis (fsQCA) identifies complex configurations of conditions leading to sustainable tourism outcomes, acknowledging equifinality in causal pathways [45]. This dual analytical strategy addresses limitations of conventional variance-based methods that presuppose linearity, additivity, and symmetrical causality. As [46] observes, social phenomena frequently exhibit complex patterns including asymmetric causality and conjunctural determination, which configurational methods effectively capture.

3.2. Sampling and Data Collection

The research employed a structured, multi-stage sampling procedure to ensure representation across geographic regions, demographic segments, and tourism experience levels. The target population comprised Vietnamese domestic tourists and international visitors with recent travel experience in Vietnam (defined as at least one overnight stay within the previous twelve months), ensuring respondents possessed direct experience with Vietnam's tourism offerings.

The sampling frame utilised a stratified approach with proportional allocation across three geographic regions (North, Central, and South Vietnam), with quota sampling ensuring balanced representation across demographic categories. Data collection occurred between September and December 2016 through intercept surveys at fifteen major tourism sites and online questionnaire distribution through tourism networks. To minimise common method bias, procedural remedies following [47] were implemented, including psychological separation between predictor and criterion variables, respondent anonymity assurance, and varied response formats.

The final sample comprised 427 valid responses (74.5% response rate), exceeding minimum requirements for both PLS-SEM analysis [44] and fsQCA [45]. The sample included 58.3% domestic Vietnamese tourists and 41.7% international visitors, with balanced gender distribution (52.7% female) and representation across age categories. Educational attainment indicated a relatively educated sample (44.5% bachelor's degree; 27.4% postgraduate qualification), reflecting the demographic profile of tourists engaged in Vietnam's mainstream tourism sector.

3.3. Measurement Instruments

The research employed a structured questionnaire comprising established scales adapted to Vietnam's tourism context through rigorous translation and validation procedures. All multi-item constructs utilised seven-point Likert scales

ranging from "strongly disagree" (1) to "strongly agree" (7), following standard practice in tourism research [43]. The questionnaire underwent forward and backward translation between English and Vietnamese by bilingual experts, followed by pilot testing with 30 respondents.

Ecological consciousness was measured as a second-order construct comprising three dimensions: environmental knowledge (six-item scale adapted from [24]), environmental concern (five-item scale derived from [26]), and perceived consumer effectiveness (four-item scale adapted from [28]). Green marketing exposure was measured using an eight-item scale adapted from [6], distinguishing between functional and emotional appeals. Sustainable tourism intentions employed a six-item scale adapted from [10], aligning with the Theory of Planned Behaviour's emphasis on intentions as proximal determinants of behaviour [13].

Sustainable tourism behaviour was measured as a second-order construct comprising three dimensions: pre-trip behaviours (five-item scale), on-site behaviours (six-item scale), and post-trip behaviours (four-item scale). Control variables included demographic characteristics, travel experience, and environmental values measured using a shortened version of the New Ecological Paradigm scale [48].

3.4. Data Analysis Procedures

The research employed a sequential analytical approach combining variance-based and configurational methods to comprehensively examine relationships between ecological consciousness, green marketing, and sustainable tourism behaviours.

3.4.1. Preliminary Data Analysis

Initial data preparation involved screening for missing values, outliers, and normality violations following procedures recommended by [43]. Missing values were minimal (<3%) and determined to be missing completely at random through Little's MCAR test ($\chi^2 = 247.63$, $df = 231$, $p = 0.213$), justifying imputation using the expectation-maximization algorithm. Outlier detection employed both univariate and multivariate methods, with extreme cases treated through winsorization rather than deletion to preserve sample size.

Common method bias assessment utilised Harman's single-factor test and the common latent factor approach [47]. The single-factor test indicated that no general factor accounted for more than 28.4% of variance, while the common latent factor approach demonstrated that method effects explained only 3.7% of total variance, suggesting minimal method bias. Preliminary analyses revealed moderate to high levels of ecological consciousness ($M = 5.13$, $SD = 1.12$) and sustainable tourism intentions ($M = 4.86$, $SD = 1.37$), with more modest levels of sustainable tourism behaviours ($M = 4.21$, $SD = 1.44$), providing initial evidence of an intention-behaviour gap.

3.4.2. Measurement Model Assessment

Evaluation of the measurement model employed a comprehensive validation procedure addressing reliability,

convergent validity, and discriminant validity following recommendations by [44]. Analysis utilised SmartPLS 3.0 software with bootstrapping (5,000 resamples).

The validation process commenced with exploratory factor analysis (EFA) employing principal component analysis with varimax rotation. Kaiser-Meyer-Olkin measure (0.893) and Bartlett's test of sphericity ($\chi^2 = 12,357.26$, $df = 1,540$, $p < 0.001$) confirmed the appropriateness of factor analysis. The EFA solution identified eight factors explaining 74.6% of total variance, with items loading on their intended factors without significant cross-loadings, supporting the hypothesised measurement structure.

Confirmatory factor analysis subsequently validated the measurement model through assessment of factor loadings, composite reliability, average variance extracted, and discriminant validity. Indicator reliability was evaluated through factor loadings with values above 0.70 deemed acceptable [49]. Internal consistency reliability was assessed using both Cronbach's alpha and composite reliability, with all constructs exceeding conventional thresholds. Convergent validity was established through average variance extracted (AVE) exceeding 0.50 for all constructs.

Discriminant validity was evaluated using both the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio of correlations [50]. The Fornell-Larcker analysis confirmed that the square root of AVE for each construct exceeded its correlations with other constructs, while HTMT ratios remained below the conservative threshold of 0.85, providing robust evidence of discriminant validity.

3.4.3. Structural Model Assessment

Structural model evaluation employed PLS-SEM to test hypothesised relationships between ecological consciousness, green marketing, and sustainable tourism behaviours. This analysis utilised a two-stage approach examining both direct effects and conditional processes to comprehensively assess the proposed theoretical framework. The PLS algorithm utilised standardised data and factor weighting scheme with 300 maximum iterations and 10^{-7} convergence criterion.

Assessment criteria included path coefficients (β), their significance levels, and explanatory power (R^2) for endogenous constructs. Additionally, effect size (f^2) quantified the impact of specific relationships, while predictive relevance (Q^2) evaluated the model's predictive capability through blindfolding procedure with omission distance of seven.

Mediation analysis employed the bootstrapping approach recommended by [44], examining indirect effects alongside direct effects to determine mediation type based on significance patterns and effect directions. Moderation analysis utilised the product indicator approach in SmartPLS, creating interaction terms between predictor and moderator variables to test conditional effects at different moderator levels.

3.4.4. Fuzzy-set Qualitative Comparative Analysis

Complementing the variance-based approach, fsQCA examined complex configurations of conditions leading to sustainable tourism behaviours. This configurational method moves beyond examining average effects of individual variables to identify combinations of factors that collectively produce outcomes of interest. The analysis employed fsQCA 3.0 software following [51].

The fsQCA procedure involved three primary steps: calibration, truth table analysis, and solution interpretation. Calibration transformed original variable values into fuzzy-set membership scores ranging from 0.0 (full non-membership) to 1.0 (full membership), utilising the direct method with three qualitative anchors: full membership (95th percentile), crossover point (50th percentile), and full non-membership (5th percentile).

Truth table analysis identified configurations with sufficient observations (frequency threshold ≥ 3) and acceptable consistency (consistency threshold ≥ 0.80) in producing the outcome. Standard analysis generated three solution types: complex, parsimonious, and intermediate, with the intermediate solution preferred for interpretation as it balances parsimony with theoretical fidelity [45].

4. RESEARCH FINDINGS

4.1 Measurement model assessment

The measurement model assessment commenced with exploratory factor analysis (EFA) employing principal component analysis with varimax rotation to ensure construct validity. The Kaiser-Meyer-Olkin measure yielded a value of 0.893, exceeding the recommended threshold of 0.60, while Bartlett's test of sphericity demonstrated statistical significance ($\chi^2 = 12,357.26$, $df = 1,540$, $p < 0.001$), confirming the suitability of the data for factor analysis. The EFA extracted eight factors with eigenvalues exceeding 1.0, collectively explaining 74.6% of the total variance. All items loaded substantially on their intended factors (> 0.60) without significant cross-loadings (< 0.40), providing initial support for the hypothesized measurement structure.

Confirmatory factor analysis subsequently validated the measurement model through comprehensive assessment of factor loadings, reliability measures, and validity indicators. Table 1 presents the measurement model results, including standardized factor loadings, reliability coefficients, and convergent validity metrics for all constructs.

Table 1: Measurement Model Assessment

Construct	Item	Loading	α	CR	AVE
Environmental Knowledge (EK)	EK1	0.83	0.89	0.91	0.64
	EK2	0.82			
	EK3	0.76			
	EK4	0.78			
	EK5	0.85			
	EK6	0.74			

Environmental Concern (EC)	EC1	0.87	0.91	0.93	0.73
	EC2	0.89			
	EC3	0.84			
	EC4	0.82			
	EC5	0.85			
Perceived Consumer Effectiveness (PCE)	PCE1	0.87	0.88	0.92	0.74
	PCE2	0.89			
	PCE3	0.86			
	PCE4	0.82			
Green Marketing Exposure (GME)	GME1	0.75	0.90	0.92	0.59
	GME2	0.83			
	GME3	0.77			
	GME4	0.79			
	GME5	0.76			
	GME6	0.71			
	GME7	0.74			
	GME8	0.78			
Sustainable Tourism Intentions (STI)	STI1	0.87	0.93	0.94	0.73
	STI2	0.85			
	STI3	0.89			
	STI4	0.84			
	STI5	0.82			
	STI6	0.84			
Pre-Trip Sustainable Behaviour (PTSB)	PTSB1	0.81	0.89	0.92	0.69
	PTSB2	0.85			
	PTSB3	0.87			
	PTSB4	0.82			
	PTSB5	0.79			
On-Site Sustainable Behaviour (OSSB)	OSSB1	0.74	0.91	0.93	0.68
	OSSB2	0.85			
	OSSB3	0.86			
	OSSB4	0.83			
	OSSB5	0.87			
	OSSB6	0.79			
Post-Trip Sustainable Behaviour (PostSB)	PostSB1	0.86	0.89	0.92	0.75

	PostSB 2	0.89			
	PostSB 3	0.87			
	PostSB 4	0.84			

Note: α = Cronbach's alpha; CR = Composite Reliability; AVE = Average Variance Extracted

As indicated in Table 1, all indicator loadings exceeded the recommended threshold of 0.70 [49], with values ranging from 0.71 to 0.89, demonstrating substantial relationships between indicators and their respective constructs. Internal consistency reliability was assessed through both Cronbach's alpha and composite reliability, with all constructs exceeding the recommended threshold of 0.70. Cronbach's alpha values ranged from 0.88 to 0.93, while composite reliability values ranged from 0.91 to 0.94, indicating excellent internal consistency across all measurement scales.

Convergent validity was established through average variance extracted (AVE), with all constructs exceeding the recommended threshold of 0.50 [44]. AVE values ranged from 0.59 (Green Marketing Exposure) to 0.75 (Post-Trip Sustainable Behaviour), indicating that constructs capture more than 50% of variance in their respective indicators. These findings collectively establish the reliability and convergent validity of measurement scales employed in this research.

Discriminant validity was assessed using both the Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) ratio of correlations, with results presented in Tables 2 and 3, respectively.

Table 2: Discriminant Validity Assessment - Fornell-Larcker Criterion

Construct	1	2	3	4	5	6	7	8
1. Environmental Knowledge	0.80							
2. Environmental Concern	0.56	0.85						
3. Perceived Consumer Effectiveness	0.48	0.52	0.86					
4. Green Marketing Exposure	0.39	0.44	0.41	0.77				
5. Sustainable Tourism Intentions	0.54	0.61	0.57	0.49	0.85			

6. Pre-Trip Sustainable Behaviour	0.45	0.48	0.52	0.43	0.62	0.83		
7. On-Site Sustainable Behaviour	0.42	0.46	0.49	0.41	0.58	0.54	0.82	
8. Post-Trip Sustainable Behaviour	0.38	0.43	0.45	0.37	0.51	0.46	0.49	0.87

Note: Square root of AVE shown in diagonal (bold)

Table 3: Discriminant Validity Assessment - HTMT Ratio

Construct	1	2	3	4	5	6	7	8
1. Environmental Knowledge								
2. Environmental Concern	0.62							
3. Perceived Consumer Effectiveness	0.54	0.58						
4. Green Marketing Exposure	0.44	0.48	0.46					
5. Sustainable Tourism Intentions	0.59	0.67	0.63	0.54				
6. Pre-Trip Sustainable Behaviour	0.51	0.53	0.58	0.48	0.68			
7. On-Site Sustainable Behaviour	0.47	0.51	0.54	0.45	0.64	0.60		
8. Post-Trip Sustainable Behaviour	0.43	0.48	0.51	0.42	0.57	0.51	0.55	

The Fornell-Larcker analysis confirmed that the square root of AVE for each construct (presented in the diagonal of Table 2) exceeded its correlations with other constructs, indicating that each construct shares more variance with its indicators than with other constructs in the model. Additionally, the HTMT ratios presented in Table 3 remained below the conservative threshold of 0.85 recommended by [50], with values ranging from 0.42 to 0.68, providing robust evidence of discriminant validity.

These comprehensive assessments establish the reliability, convergent validity, and discriminant validity of the measurement model, providing a sound foundation for subsequent structural analysis and hypothesis testing. The validated measurement model demonstrates excellent psychometric properties, ensuring confidence in findings derived from structural relationships between constructs.

4.2. Structural estimation model assessment

The structural model assessment evaluated causal relationships between ecological consciousness dimensions, green marketing exposure, sustainable tourism intentions, and sustainable tourism behaviours. This analysis employed the PLS algorithm with standardized data and factor weighting scheme, while significance testing utilized bootstrapping with 5,000 resamples. Table 4 presents direct effects results, including standardized path coefficients, significance levels, and confidence intervals.

Table 4: Direct Effects Results

Relationship	Path Coefficient	t-Value	p-Value	95 % CI	Support
Environmental Knowledge → Sustainable Tourism Intentions	0.24	4.83	<0.001	[0.15, 0.34]	Yes
Environmental Concern → Sustainable Tourism Intentions	0.32	6.37	<0.001	[0.22, 0.42]	Yes
Perceived Consumer Effectiveness → Sustainable Tourism Intentions	0.28	5.74	<0.001	[0.18, 0.37]	Yes
Green Marketing Exposure → Sustainable Tourism Intentions	0.19	4.12	<0.001	[0.10, 0.28]	Yes
Environmental Knowledge → Pre-Trip Sustainable Behaviour	0.16	3.24	0.001	[0.06, 0.25]	Yes

Environmental Knowledge → On-Site Sustainable Behaviour	0.14	2.86	0.004	[0.05, 0.24]	Yes
Environmental Knowledge → Post-Trip Sustainable Behaviour	0.09	1.87	0.061	[-0.01, 0.19]	No
Environmental Concern → Pre-Trip Sustainable Behaviour	0.14	2.73	0.006	[0.04, 0.24]	Yes
Environmental Concern → On-Site Sustainable Behaviour	0.13	2.54	0.011	[0.03, 0.23]	Yes
Environmental Concern → Post-Trip Sustainable Behaviour	0.12	2.39	0.017	[0.02, 0.22]	Yes
Perceived Consumer Effectiveness → Pre-Trip Sustainable Behaviour	0.21	4.18	<0.001	[0.11, 0.30]	Yes
Perceived Consumer Effectiveness → On-Site Sustainable Behaviour	0.19	3.87	<0.001	[0.10, 0.29]	Yes
Perceived Consumer Effectiveness → Post-Trip Sustainable Behaviour	0.16	3.25	0.001	[0.07, 0.26]	Yes
Green Marketing Exposure → Pre-Trip	0.14	2.96	0.003	[0.05, 0.24]	Yes

Sustainable Behaviour					
Green Marketing Exposure → On-Site Sustainable Behaviour	0.12	2.48	0.013	[0.03, 0.22]	Yes
Green Marketing Exposure → Post-Trip Sustainable Behaviour	0.09	1.85	0.065	[-0.01, 0.19]	No
Sustainable Tourism Intentions → Pre-Trip Sustainable Behaviour	0.41	8.35	<0.001	[0.31, 0.50]	Yes
Sustainable Tourism Intentions → On-Site Sustainable Behaviour	0.38	7.64	<0.001	[0.28, 0.47]	Yes
Sustainable Tourism Intentions → Post-Trip Sustainable Behaviour	0.35	6.97	<0.001	[0.25, 0.45]	Yes

As indicated in Table 4, the structural model reveals significant relationships between ecological consciousness dimensions and sustainable tourism intentions, with environmental concern demonstrating the strongest effect ($\beta = 0.32$, $p < 0.001$), followed by perceived consumer effectiveness ($\beta = 0.28$, $p < 0.001$) and environmental knowledge ($\beta = 0.24$, $p < 0.001$). These findings indicate that all three dimensions of ecological consciousness positively influence intentions to engage in sustainable tourism behaviours, with the affective dimension (environmental concern) exhibiting the strongest impact. Green marketing exposure also significantly influences sustainable tourism intentions ($\beta = 0.19$, $p < 0.001$), though with smaller magnitude than ecological consciousness dimensions.

Direct effects of ecological consciousness dimensions on sustainable tourism behaviours reveal more complex patterns. Environmental knowledge significantly influences pre-trip ($\beta = 0.16$, $p = 0.001$) and on-site behaviours ($\beta = 0.14$, $p = 0.004$) but not post-trip behaviours ($\beta = 0.09$, $p = 0.061$). Environmental concern demonstrates significant effects across all behavioural dimensions: pre-trip ($\beta = 0.14$, $p = 0.006$), on-site ($\beta = 0.13$, $p = 0.011$), and post-trip ($\beta = 0.12$, $p = 0.017$). Perceived consumer effectiveness exhibits the strongest direct effects on all behavioural dimensions: pre-trip

($\beta = 0.21$, $p < 0.001$), on-site ($\beta = 0.19$, $p < 0.001$), and post-trip ($\beta = 0.16$, $p = 0.001$). These findings indicate that perceived consumer effectiveness—the belief that individual actions make a difference—constitutes the most powerful direct driver of sustainable tourism behaviours among ecological consciousness dimensions.

Sustainable tourism intentions demonstrate strong positive effects on all behavioural dimensions: pre-trip ($\beta = 0.41$, $p < 0.001$), on-site ($\beta = 0.38$, $p < 0.001$), and post-trip ($\beta = 0.35$, $p < 0.001$). These substantial coefficients indicate that intentions represent powerful predictors of actual behaviours, though the intention-behaviour gap remains evident in the magnitude differences between these coefficients and R^2 values for behavioural dimensions.

Table 5 presents the predictive relevance assessment, including explained variance (R^2), adjusted R^2 , effect size (f^2), and predictive relevance (Q^2) for all endogenous constructs in the model.

Table 5: Predictive Relevance Assessment

Endogenous Construct	R^2	R^2 Adjusted	Q^2	Predictive Relevance
Sustainable Tourism Intentions	0.59	0.58	0.43	Strong
Pre-Trip Sustainable Behaviour	0.52	0.51	0.35	Strong
On-Site Sustainable Behaviour	0.47	0.46	0.32	Strong
Post-Trip Sustainable Behaviour	0.39	0.38	0.29	Medium

The model demonstrates substantial explanatory power for sustainable tourism intentions ($R^2 = 0.59$), indicating that ecological consciousness dimensions and green marketing exposure collectively explain approximately 59% of variance in intentions. Behavioural dimensions exhibit moderate to substantial explained variance: pre-trip ($R^2 = 0.52$), on-site ($R^2 = 0.47$), and post-trip ($R^2 = 0.39$). This pattern suggests greater predictive power for behaviours occurring before and during tourism experiences compared to post-experience behaviours, potentially due to contextual factors influencing post-trip actions.

Predictive relevance assessment through blindfolding procedure (omission distance = 7) yielded Q^2 values exceeding zero for all endogenous constructs, indicating predictive relevance of the structural model. Following Hair et al. (2017), Q^2 values between 0.25 and 0.50 indicate medium to large predictive relevance. The model demonstrates strong predictive relevance for sustainable tourism intentions ($Q^2 = 0.43$), pre-trip behaviour ($Q^2 = 0.35$), and on-site behaviour ($Q^2 = 0.32$), with medium predictive relevance for post-trip behaviour ($Q^2 = 0.29$).

The research examined mediating effects through analysis of specific indirect effects, with results presented in Table 6.

Table 6: Specific Indirect Effects (Path Coefficient)

Indirect Path	Indirect Effect	t-Value	p-Value	95% CI	Mediation Type
EK → STI → PTSB	0.10	4.18	<0.001	[0.05, 0.15]	Complementary
EK → STI → OSSB	0.09	4.07	<0.001	[0.05, 0.14]	Complementary
EK → STI → PostSB	0.08	3.89	<0.001	[0.04, 0.13]	Indirect-only
EC → STI → PTSB	0.13	5.10	<0.001	[0.08, 0.18]	Complementary
EC → STI → OSSB	0.12	4.89	<0.001	[0.07, 0.17]	Complementary
EC → STI → PostSB	0.11	4.63	<0.001	[0.06, 0.16]	Complementary
PCE → STI → PTSB	0.11	4.64	<0.001	[0.07, 0.16]	Complementary
PCE → STI → OSSB	0.11	4.49	<0.001	[0.06, 0.15]	Complementary
PCE → STI → PostSB	0.10	4.28	<0.001	[0.05, 0.15]	Complementary
GME → STI → PTSB	0.08	3.57	<0.001	[0.04, 0.12]	Complementary
GME → STI → OSSB	0.07	3.52	<0.001	[0.03, 0.11]	Complementary
GME → STI → PostSB	0.07	3.42	0.001	[0.03, 0.11]	Indirect-only

Note: EK = Environmental Knowledge; EC = Environmental Concern; PCE = Perceived Consumer Effectiveness; GME = Green Marketing Exposure; STI = Sustainable Tourism Intentions; PTSB = Pre-Trip Sustainable Behaviour; OSSB = On-Site Sustainable Behaviour; PostSB = Post-Trip Sustainable Behaviour

Mediation analysis reveals that sustainable tourism intentions significantly mediate the relationships between all ecological consciousness dimensions and sustainable tourism behaviours. The indirect effects of environmental knowledge on pre-trip ($\beta = 0.10$, $p < 0.001$) and on-site behaviours ($\beta = 0.09$, $p < 0.001$) represent complementary mediation, as both direct and indirect effects are significant and positive. However, the relationship between environmental knowledge and post-trip behaviour demonstrates indirect-only mediation ($\beta = 0.08$, $p < 0.001$), as the direct effect is non-significant while the indirect effect through intentions remains significant.

Environmental concern exhibits complementary mediation across all behavioural dimensions: pre-trip ($\beta = 0.13$, $p < 0.001$), on-site ($\beta = 0.12$, $p < 0.001$), and post-trip ($\beta = 0.11$, $p < 0.001$). Similarly, perceived consumer effectiveness demonstrates complementary mediation across all dimensions: pre-trip ($\beta = 0.11$, $p < 0.001$), on-site ($\beta = 0.11$, $p < 0.001$), and post-trip ($\beta = 0.10$, $p < 0.001$). These findings indicate that sustainable tourism intentions partially mediate the relationships between these ecological consciousness dimensions and behavioural outcomes.

Green marketing exposure exhibits complementary mediation for pre-trip ($\beta = 0.08$, $p < 0.001$) and on-site behaviours ($\beta = 0.07$, $p < 0.001$), but indirect-only mediation for post-trip behaviour ($\beta = 0.07$, $p = 0.001$). This pattern suggests that green marketing influences post-trip behaviours exclusively through the formation of sustainable tourism intentions, while exerting both direct and indirect effects on pre-trip and on-site behaviours.

Moderation analysis examined the conditioning effects of green marketing exposure on relationships between ecological consciousness dimensions and sustainable tourism intentions. Table 7 presents these moderation results, including interaction terms, path coefficients, and significance levels.

Table 7: Moderation Analysis Results

Interaction Term	Path Coefficient	t-Value	p-Value	95% CI	Support
EK × GME → STI	0.09	2.13	0.033	[0.01, 0.18]	Yes
EC × GME → STI	0.12	2.58	0.010	[0.03, 0.21]	Yes
PCE × GME → STI	0.14	2.96	0.003	[0.05, 0.23]	Yes

Note: EK = Environmental Knowledge; EC = Environmental Concern; PCE = Perceived Consumer Effectiveness; GME = Green Marketing Exposure; STI = Sustainable Tourism Intentions

Moderation analysis reveals that green marketing exposure significantly moderates the relationships between all ecological consciousness dimensions and sustainable tourism intentions. The interaction between green marketing exposure and environmental knowledge ($\beta = 0.09$, $p = 0.033$) indicates that green marketing strengthens the positive relationship between knowledge and intentions. Similarly, green marketing positively moderates the effects of environmental concern ($\beta = 0.12$, $p = 0.010$) and perceived consumer effectiveness ($\beta = 0.14$, $p = 0.003$) on sustainable tourism intentions.

Simple slopes analysis (not tabulated) indicates that the relationship between ecological consciousness dimensions and sustainable tourism intentions becomes stronger at higher levels of green marketing exposure. This pattern suggests that green marketing serves as a catalyst that enhances the translation of ecological consciousness into behavioural intentions, particularly for individuals with higher exposure to environmental marketing messages. The moderation effect appears strongest for perceived consumer effectiveness, suggesting that green marketing particularly enhances the

relationship between self-efficacy beliefs and sustainable tourism intentions.

These comprehensive structural analyses establish the direct, indirect, and conditional relationships between ecological consciousness dimensions, green marketing exposure, sustainable tourism intentions, and sustainable tourism behaviours in Vietnam's tourism context. The findings reveal complex patterns suggesting that ecological consciousness influences sustainable tourism through multiple pathways, with green marketing serving as both independent predictor and moderating condition that shapes these relationships.

4.3. Fuzzy-set Qualitative Comparative Analysis (fsQCA)

Complementing the variance-based approach, fsQCA examined complex configurations of conditions leading to sustainable tourism behaviours. This configurational analysis identified multiple pathways through which ecological consciousness dimensions and green marketing exposure combine to produce sustainable tourism outcomes, acknowledging the principle of equifinality in complex social phenomena. Table 8 presents fsQCA results for high sustainable tourism behaviour, including configuration patterns, consistency, and coverage measures.

Table 8: Configurations for High Sustainable Tourism Behaviour

Configuration	Environmental Knowledge	Environmental Concern	Perceived Consumer Effectiveness	Green Marketing Exposure	Raw Coverage	Unique Coverage	Consistency
1	●	●	●	○	0.42	0.09	0.91
2	●	●	○	●	0.38	0.06	0.89
3	●	○	●	●	0.35	0.04	0.87
4	○	●	●	●	0.33	0.03	0.86
Solution Coverage	0.73						
Solution Consistency	0.88						

Note: ● = Presence of condition; ○ = Absence of condition; blank cell = Condition may be either present or absent

The fsQCA results identify four configurations consistently leading to high sustainable tourism behaviour, with overall solution coverage of 0.73 and solution consistency of 0.88. These metrics indicate that the identified configurations collectively explain 73% of instances of high sustainable tourism behaviour with 88% consistency, representing excellent explanatory power according to [45]'s guidelines. Configuration 1 combines high levels of all three ecological consciousness dimensions (environmental knowledge, environmental concern, and perceived consumer effectiveness) with low green marketing exposure. This configuration demonstrates the highest raw coverage (0.42), indicating its empirical relevance in explaining sustainable tourism behaviour. The pattern suggests that when individuals possess comprehensive ecological consciousness across cognitive, affective, and conative dimensions, they may

engage in sustainable tourism behaviours even without substantial marketing influence. This configuration aligns with Value-Belief-Norm theory's emphasis on internal values and personal norms as drivers of pro-environmental behaviour [20].

Configuration 2 combines high environmental knowledge, high environmental concern, and high green marketing exposure, with perceived consumer effectiveness being either high or low (irrelevant condition). This pattern indicates that when individuals possess both cognitive understanding (knowledge) and emotional engagement (concern) regarding environmental issues, alongside exposure to green marketing, they may engage in sustainable tourism behaviours regardless of their beliefs about individual efficacy. With raw coverage of 0.38, this configuration represents the second most empirically relevant pathway to sustainable tourism behaviour.

Configuration 3 combines high environmental knowledge, high perceived consumer effectiveness, and high green marketing exposure, with environmental concern being either high or low (irrelevant condition). This pattern suggests that when individuals possess both cognitive understanding (knowledge) and self-efficacy beliefs (perceived effectiveness), alongside green marketing exposure, they may engage in sustainable tourism behaviours regardless of their emotional engagement with environmental issues. This configuration exhibits raw coverage of 0.35, representing the third most empirically relevant pathway.

Configuration 4 combines high environmental concern, high perceived consumer effectiveness, and high green marketing exposure, with environmental knowledge being either high or low (irrelevant condition). This pattern indicates that when individuals possess both emotional engagement (concern) and self-efficacy beliefs (effectiveness), alongside green marketing exposure, they may engage in sustainable tourism behaviours regardless of their cognitive understanding of environmental issues. This configuration demonstrates raw coverage of 0.33, representing the fourth most empirically relevant pathway.

Collectively, these configurations reveal three important insights about sustainable tourism behaviour in Vietnam. First, they demonstrate equifinality, as multiple distinct pathways lead to the same outcome of high sustainable tourism behaviour. Second, they indicate causal complexity, as no single condition appears necessary across all configurations, while different combinations prove sufficient for the outcome. Third, they suggest asymmetric causality, as the configurations leading to high sustainable tourism behaviour differ from those leading to its absence (analysis of absence not tabulated).

Furthermore, the configurations reveal interesting patterns regarding the role of green marketing exposure. In Configuration 1, green marketing appears unnecessary when all ecological consciousness dimensions are high, suggesting internal motivations may suffice for sustainable behaviour among environmentally conscious individuals. However, in Configurations 2-4, green marketing exposure appears as a consistent element alongside various combinations of ecological consciousness dimensions, suggesting that marketing plays an important complementary role when ecological consciousness is partial rather than comprehensive.

These fsQCA findings complement the variance-based results by illuminating complex configurational patterns beyond linear relationships. While SEM analysis identified average effects across the sample, fsQCA reveals specific combinations of conditions that consistently produce sustainable tourism outcomes, acknowledging heterogeneity in causal pathways. This dual analytical approach provides comprehensive understanding of both general tendencies and specific configurations that shape sustainable tourism behaviour in Vietnam's emerging market context.

5. DISCUSSION OF RESEARCH RESULTS AND CONCLUSIONS

This research elucidates the intricate pathways through which ecological consciousness influences sustainable tourism behaviours in Vietnam's emerging market context, with green marketing functioning simultaneously as independent driver and moderating condition. The findings reveal multifaceted patterns transcending linear models predominant in extant literature, thereby offering nuanced insights for theoretical advancement and practical application.

The multidimensional conceptualisation of ecological consciousness receives robust empirical support, confirming that environmental knowledge, environmental concern, and perceived consumer effectiveness constitute discrete yet interrelated dimensions that differentially influence sustainable tourism outcomes. This finding aligns with [23]'s contention regarding the cognitive, affective, and conative dimensions of ecological consciousness whilst extending their framework by demonstrating varying impacts across tourism consumption stages. Environmental knowledge primarily influences pre-trip and on-site behaviours but demonstrates non-significant effects on post-trip actions, corresponding with [41]'s observation regarding knowledge transfer limitations between home and tourism contexts. Environmental concern demonstrates significant effects across all behavioural dimensions, reinforcing [26]'s argument that affective dimensions create enduring motivational foundations for sustainable behaviours, though the moderate magnitude suggests concern alone provides insufficient impetus for comprehensive behavioural adoption, potentially explaining the attitude-behaviour gap identified by [40].

Perceived consumer effectiveness emerges as the strongest direct predictor across all dimensions, extending [28]'s conceptualisation by demonstrating its particular importance in experiential service contexts where individual impacts may appear limited compared to collective industry effects. The mediating role of sustainable tourism intentions receives strong empirical support, confirming the Theory of Planned Behaviour's central proposition [13], though the analysis reveals complex mediation patterns aligning with [10]'s observation that tourism behaviours involve complex decision processes beyond linear attitude-intention-behaviour sequences.

Green marketing functions as both independent predictor and moderating condition, confirming [2]'s contention regarding marketing's multifaceted role in sustainable consumption. As independent predictor, green marketing directly influences sustainable tourism intentions and pre-trip/on-site behaviours, though with smaller magnitude than ecological consciousness dimensions. As moderating condition, it enhances relationships between ecological consciousness dimensions and sustainable tourism intentions, particularly for perceived consumer effectiveness.

The configurational analysis through fsQCA reveals multiple pathways to sustainable tourism behaviour,

demonstrating equifinality and supporting [45]'s contention that social outcomes frequently result from complex conjunctural causation rather than isolated variable effects. Particularly noteworthy is the configuration combining all three ecological consciousness dimensions without significant marketing exposure, aligning with Value-Belief-Norm theory's emphasis on internal values as primary drivers of pro-environmental behaviour [20].

Practical implications include prioritising interventions enhancing perceived consumer effectiveness through feedback mechanisms demonstrating individual contributions to environmental conservation [27]. Tourism marketers should develop differentiated communications targeting specific dimensions of ecological consciousness across consumption stages. Policy implications encompass comprehensive approaches simultaneously addressing multiple dimensions whilst creating supportive infrastructure for sustainable choices.

Despite its contributions, this research exhibits limitations including cross-sectional design precluding definitive causal inferences and reliance on self-reported behaviour creating potential social desirability bias. Future research directions include longitudinal studies examining evolutionary patterns, observational studies measuring actual behaviours, cross-cultural comparative analyses, and experimental designs manipulating specific dimensions of green marketing.

6. ACKNOWLEDGMENTS

I would like to express my sincere gratitude to Dr. Hoang Vu Hiep for his invaluable guidance and inspiration throughout this research. His expertise, insights, and unwavering support have been instrumental in shaping the direction and quality of this study. I am deeply appreciative of his generosity in sharing his time, knowledge, and network, which have greatly contributed to the success of this research. His mentorship and commitment to academic excellence have not only enriched the quality of this work but have also had a profound impact on my personal and professional growth.

7. REFERENCES

- [1] A. Holden, *Environment and tourism*, 3rd ed. London: Routledge, 2016.
- [2] X. Font and S. McCabe, "Sustainability and marketing in tourism: Its contexts, paradoxes, approaches, challenges and potential," *Journal of Sustainable Tourism*, vol. 25, no. 7, pp. 869-883, 2017.
- [3] I. Rahman and D. Reynolds, "Predicting green hotel behavioral intentions using a theory of environmental commitment and sacrifice for the environment," *International Journal of Hospitality Management*, vol. 52, pp. 107-116, 2016.
- [4] T. N. Nguyen, A. Lobo, and S. Greenland, "Energy efficient household appliances in emerging markets: The influence of consumers' values and knowledge on their attitudes and purchase behaviour," *International Journal of Consumer Studies*, vol. 41, no. 2, pp. 167-177, 2017.

- [5] Y.-K. Lee, S. Kim, M.-S. Kim, and J.-G. Choi, "Antecedents and interrelationships of three types of pro-environmental behavior," *Journal of Business Research*, vol. 67, no. 10, pp. 2097-2105, 2014.
- [6] C. N. Leonidou, C. S. Katsikeas, and N. A. Morgan, "'Greening' the marketing mix: Do firms do it and does it pay off?," *Journal of the Academy of Marketing Science*, vol. 41, no. 2, pp. 151-170, 2013.
- [7] Vietnam National Administration of Tourism, "Tourism statistics report 2016," Hanoi: Vietnam National Administration of Tourism, 2017.
- [8] H. M. Vu, T. T. H. Phan, and A. N. H. Le, "Factors affecting ecological intention of international tourists: The case of Halong Bay, Vietnam," *Journal of Economics and Development*, vol. 18, no. 2, pp. 37-56, 2016.
- [9] T. V. Nguyen and J. Rose, "Building trust—Evidence from Vietnamese entrepreneurs," *Journal of Business Venturing*, vol. 24, no. 2, pp. 165-182, 2009.
- [10] H. Han, L.-T. Hsu, and C. Sheu, "Application of the theory of planned behavior to green hotel choice: Testing the effect of environmental friendly activities," *Tourism Management*, vol. 31, no. 3, pp. 325-334, 2010.
- [11] Vietnam Ministry of Culture, Sports and Tourism, "Vietnam tourism development strategy to 2020, vision to 2030," Hanoi: Vietnam National Administration of Tourism, 2011.
- [12] V. D. Truong and C. M. Hall, "Corporate social marketing in tourism: To sleep or not to sleep with the enemy?," *Journal of Sustainable Tourism*, vol. 25, no. 7, pp. 884-902, 2017.
- [13] I. Ajzen, "The theory of planned behavior," *Organizational Behavior and Human Decision Processes*, vol. 50, no. 2, pp. 179-211, 1991.
- [14] S. Bamberg and G. Möser, "Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psychosocial determinants of pro-environmental behaviour," *Journal of Environmental Psychology*, vol. 27, no. 1, pp. 14-25, 2007.
- [15] C. H. Hsu and S. Huang, "An extension of the theory of planned behavior model for tourists," *Journal of Hospitality & Tourism Research*, vol. 36, no. 3, pp. 390-417, 2012.
- [16] R. Y. K. Chan and L. B. Y. Lau, "Explaining green purchasing behavior: A cross-cultural study on American and Chinese consumers," *Journal of International Consumer Marketing*, vol. 14, no. 2-3, pp. 9-40, 2002.
- [17] T.-M. Cheng and H. C. Wu, "How do environmental knowledge, environmental sensitivity, and place attachment affect environmentally responsible behavior? An integrated approach for sustainable island tourism," *Journal of Sustainable Tourism*, vol. 23, no. 4, pp. 557-576, 2015.
- [18] K. Kiatkawsin and H. Han, "Young travelers' intention to behave pro-environmentally: Merging the value-belief-norm theory and the expectancy theory," *Tourism Management*, vol. 59, pp. 76-88, 2017.
- [19] P. C. Stern, T. Dietz, T. Abel, G. A. Guagnano, and L. Kalof, "A value-belief-norm theory of support for social movements: The case of environmentalism," *Human Ecology Review*, vol. 6, no. 2, pp. 81-97, 1999.

- [20] P. C. Stern, "Toward a coherent theory of environmentally significant behavior," *Journal of Social Issues*, vol. 56, no. 3, pp. 407-424, 2000.
- [21] L. Steg and C. Vlek, "Encouraging pro-environmental behaviour: An integrative review and research agenda," *Journal of Environmental Psychology*, vol. 29, no. 3, pp. 309-317, 2009.
- [22] A. Budeanu, "Sustainable tourist behaviour – a discussion of opportunities for change," *International Journal of Consumer Studies*, vol. 31, no. 5, pp. 499-508, 2007.
- [23] B. B. Schlegelmilch, G. M. Bohlen, and A. Diamantopoulos, "The link between green purchasing decisions and measures of environmental consciousness," *European Journal of Marketing*, vol. 30, no. 5, pp. 35-55, 1996.
- [24] F. G. Kaiser, S. Wölfling, and U. Fuhrer, "Environmental attitude and ecological behaviour," *Journal of Environmental Psychology*, vol. 19, no. 1, pp. 1-19, 1999.
- [25] G. E. Fryxell and C. W. H. Lo, "The influence of environmental knowledge and values on managerial behaviours on behalf of the environment: An empirical examination of managers in China," *Journal of Business Ethics*, vol. 46, no. 1, pp. 45-69, 2003.
- [26] P. W. Schultz, "The structure of environmental concern: Concern for self, other people, and the biosphere," *Journal of Environmental Psychology*, vol. 21, no. 4, pp. 327-339, 2001.
- [27] Y. Kim and S. M. Choi, "Antecedents of green purchase behavior: An examination of collectivism, environmental concern, and PCE," *Advances in Consumer Research*, vol. 32, pp. 592-599, 2005.
- [28] P. S. Ellen, J. L. Wiener, and C. Cobb-Walgren, "The role of perceived consumer effectiveness in motivating environmentally conscious behaviors," *Journal of Public Policy & Marketing*, vol. 10, no. 2, pp. 102-117, 1991.
- [29] S. Dolnicar and F. Leisch, "An investigation of tourists' patterns of obligation to protect the environment," *Journal of Travel Research*, vol. 46, no. 4, pp. 381-391, 2008.
- [30] Y. Le and S. J. Hollenhorst, "Perceptions of Vietnamese tourists and tour providers toward ecotourism in Vietnam," in *Proceedings of the 2005 Northeastern Recreation Research Symposium*, J. Chen, M. Uysal, and D. R. Williams, Eds. Bolton Landing, NY: U.S. Forest Service, pp. 350-358, 2005.
- [31] M. J. Polonsky, "Transformative green marketing: Impediments and opportunities," *Journal of Business Research*, vol. 64, no. 12, pp. 1311-1319, 2011.
- [32] K. White, R. MacDonnell, and J. H. Ellard, "Belief in a just world: Consumer intentions and behaviors toward ethical products," *Journal of Marketing*, vol. 76, no. 1, pp. 103-118, 2012.
- [33] S. Dolnicar, G. I. Crouch, and P. Long, "Environment-friendly tourists: What do we really know about them?," *Journal of Sustainable Tourism*, vol. 16, no. 2, pp. 197-210, 2008.
- [34] M. A. Delmas and V. C. Burbano, "The drivers of greenwashing," *California Management Review*, vol. 54, no. 1, pp. 64-87, 2011.
- [35] E. S. W. Chan, "Gap analysis of green hotel marketing," *International Journal of Contemporary Hospitality Management*, vol. 25, no. 7, pp. 1017-1048, 2013.
- [36] A. Kasim, "Socio-environmentally responsible hotel business: Do tourists to Penang Island, Malaysia care?," *Journal of Hospitality & Leisure Marketing*, vol. 11, no. 4, pp. 5-28, 2004.
- [37] M. Sigala, "Customer involvement in sustainable supply chain management: A research framework and implications in tourism," *Cornell Hospitality Quarterly*, vol. 55, no. 1, pp. 76-88, 2014.
- [38] P. J. Do and M. Kumar, "Resource-efficient supply chains for sustainability," *International Journal of Logistics Research and Applications*, vol. 19, no. 2, pp. 114-132, 2016.
- [39] T. H. Lee and G. Moscardo, "Understanding the impact of ecotourism resort experiences on tourists' environmental attitudes and behavioural intentions," *Journal of Sustainable Tourism*, vol. 13, no. 6, pp. 546-565, 2005.
- [40] E. Juvan and S. Dolnicar, "The attitude—behaviour gap in sustainable tourism," *Annals of Tourism Research*, vol. 48, pp. 76-95, 2014.
- [41] S. Barr, G. Shaw, T. Coles, and J. Prillwitz, "A holiday is a holiday: Practicing sustainability, home and away," *Journal of Transport Geography*, vol. 18, no. 3, pp. 474-481, 2010.
- [42] R. Doran and S. Larsen, "The relative importance of social and personal norms in explaining intentions to choose eco-friendly travel options," *International Journal of Tourism Research*, vol. 18, no. 2, pp. 159-166, 2016.
- [43] J. F. Hair, W. C. Black, B. J. Babin, and R. E. Anderson, *Multivariate data analysis*, 7th ed. Harlow, UK: Pearson Education Limited, 2014.
- [44] J. F. Hair, G. T. M. Hult, C. M. Ringle, and M. Sarstedt, *A primer on partial least squares structural equation modeling (PLS-SEM)*, 2nd ed. Thousand Oaks, CA: Sage Publications, 2017.
- [45] C. C. Ragin, *Redesigning social inquiry: Fuzzy sets and beyond*. Chicago, IL: University of Chicago Press, 2008.
- [46] A. G. Woodside, "Moving beyond multiple regression analysis to algorithms: Calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory," *Journal of Business Research*, vol. 66, no. 4, pp. 463-472, 2013.
- [47] P. M. Podsakoff, S. B. MacKenzie, J.-Y. Lee, and N. P. Podsakoff, "Common method biases in behavioral research: A critical review of the literature and recommended remedies," *Journal of Applied Psychology*, vol. 88, no. 5, pp. 879-903, 2003.
- [48] R. E. Dunlap, K. D. Van Liere, A. G. Mertig, and R. E. Jones, "Measuring endorsement of the new ecological paradigm: A revised NEP scale," *Journal of Social Issues*, vol. 56, no. 3, pp. 425-442, 2000.
- [49] W. W. Chin, "The partial least squares approach to structural equation modeling," in *Modern methods for business research*, G. A. Marcoulides, Ed. Mahwah, NJ: Lawrence Erlbaum Associates, pp. 295-336, 1998.

[50] J. Henseler, C. M. Ringle, and M. Sarstedt, "A new criterion for assessing discriminant validity in variance-based structural equation modeling," *Journal of the Academy of Marketing Science*, vol. 43, no. 1, pp. 115-135, 2015.

[51] C. Q. Schneider and C. Wagemann, *Set-theoretic methods for the social sciences: A guide to qualitative comparative analysis*. Cambridge, UK: Cambridge University Press, 2012.