



Destination Brand Satisfaction in Nature-Based Tourism: Image and Experience as Primary Drivers

Beby Karina Fawzee Sembiring*, Endang Sulistya Rini, Muhammad Dharma Tuah Putra Nasution

Faculty of Economics and Business, Universitas Sumatera Utara, North Sumatera, Indonesia. *Email: beby@usu.ac.id

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ABSTRACT

This study examines how destination branding elements influence tourist satisfaction in nature-based destinations, with implications for sustainable tourism management strategies. A survey of 350 domestic tourists visiting Lake Toba, Indonesia examined relationships between destination image, service environment, social interactions, tourist experiences and satisfaction. Structural equation modelling tested the conceptual framework. Destination brand image strongly influences tourist experiences and satisfaction, whilst service quality and social interactions show limited impact in this nature-based context. Tourist experiences serve as the primary driver of satisfaction. The results provide empirical evidence for contextual differences in destination satisfaction mechanisms. Destination managers in nature-based contexts should prioritise authentic branding and experiential design over traditional service improvements, whilst recognising contextual variations in tourist expectations. The research provides empirical evidence for boundary conditions of service-dominant logic in destination management, demonstrating that satisfaction mechanisms vary across destination types and extending destination branding theory through contextual validation.

Keywords: Destination Branding, Tourist Satisfaction, Nature-based Tourism, Sustainable Tourism, Tourism Management, Indonesia

JEL Classifications: L83, M31, Q26, Z33

1. INTRODUCTION

The contemporary tourism landscape has witnessed a fundamental paradigm shift (Pine and Gilmore, 1998) from traditional sightseeing towards experience-centric consumption (Schmitt, 1999), fundamentally altering how destinations create and deliver value to visitors (Ngwira et al., 2023). This transformation is particularly pronounced in nature-based destinations (Lee and Jan, 2023), where conventional service quality frameworks (Parasuraman et al., 1988) may not fully capture the complex emotional, symbolic, and transformational exchanges (Kim et al., 2024) that drive visitor satisfaction.

Recent studies on memorable tourism experiences (Guleria et al., 2023) have established that tourists increasingly seek meaningful, transformational experiences (Hosany et al., 2006) rather than passive consumption of tourism products. In nature-based contexts,

this evolution becomes particularly complex as destinations must balance authenticity preservation (Wang, 1999) with experience facilitation, creating ongoing tensions between objective and constructed authenticity in tourism development.

Despite extensive research on destination branding grounded in stimulus-organism-response theory (Mehrabian and Russell, 1974) and experiential marketing frameworks (Schmitt, 1999), systematic narrative reviews (Huang et al., 2023) reveal that three critical theoretical and empirical gaps persist that limit our understanding of how branding mechanisms operate across different destination contexts, particularly in nature-based tourism settings.

First, current destination branding literature predominantly derives from urban destination contexts (Qu et al., 2011), with limited examination of whether established frameworks apply

universally across destination types (Matiza and Slabbert, 2024; Styliadis et al., 2014). This creates potential theoretical limitations when applying urban-derived models to nature-based destinations, where experiential dynamics may differ substantially due to environmental authenticity priorities and infrastructure constraints (Barnes et al., 2014). Recent studies on user-generated content and destination image (Correia et al., 2025) and destination branding reviews (Ruiz-Real et al., 2020) indicate that nature-based destination branding remains underexplored, with fewer than 15% of destination branding studies focusing specifically on natural environment contexts.

Second, whilst destination brand experience is increasingly recognised as a crucial mediator (Brakus et al., 2009) between destination stimuli and visitor outcomes (Barnes et al., 2014), empirical validation in different contextual settings (Tang et al., 2023) remains fragmentary (Rather and Hollebeek, 2019), particularly in developing economy contexts. Research on destination brand equity relationships (Shizhen et al., 2025) shows that understanding how experiential mediation operates across different destination types (Abbasi et al., 2024) and economic contexts (Kim et al., 2024) requires systematic investigation.

Third, the literature presents conflicting evidence regarding host-guest interactions' role in destination satisfaction, with some studies demonstrating significant positive effects on tourist citizenship behavior (Li et al., 2024; Su and Wall, 2010) whilst others find negligible impacts (Fan et al., 2017). This inconsistency suggests context-dependent mechanisms (Bimonte and Punzo, 2016) that require investigation across different destination settings to establish boundary conditions for social interaction effects (Yu et al., 2024).

This study addresses these gaps by examining whether destination branding mechanisms established in urban contexts operate similarly in nature-based destinations. Using Indonesia's Lake Toba—a UNESCO Global Geopark and government-designated super priority destination (The Jakarta Post, 2020)—we investigate how destination type characteristics may influence the relative importance of different satisfaction drivers. Rather than proposing entirely new theoretical frameworks, we examine the boundary conditions and contextual applicability of established destination branding theories.

Our research investigates three primary questions: (1) How do destination brand image (Keller, 1993), tourism service environment (Bitner, 1992), and host-guest social interaction (Ap, 1992) influence destination brand experience in nature-based tourism contexts? (2) What is the mediating role of destination brand experience in translating destination stimuli into visitor satisfaction? (3) How do these relationships compare with patterns established in urban destination research (Qu et al., 2011)?

This study contributes to destination branding literature by providing empirical evidence for contextual variations in satisfaction mechanisms, establishing boundary conditions for service-dominant logic application (Vargo and Lusch, 2004), and offering practical insights for destination managers operating

in nature-based contexts. As destinations globally recover from pandemic impacts (UNWTO, 2024) and address cultural tourism development (Gaonkar and Sukthankar, 2025), understanding contextual variations in experiential mechanisms becomes crucial for tailored destination development strategies.

2. LITERATURE REVIEW

2.1. Theoretical Foundations

This study draws upon three primary theoretical frameworks to understand destination branding relationships. The stimulus-organism-response (S-O-R) model, extensively applied in recent tourism research (Jeong and Shin, 2020; Buhalis et al., 2023), provides the overarching framework based on Mehrabian and Russell's (1974) foundational work, positioning destination attributes as stimuli that influence tourists' internal experiential states, ultimately determining satisfaction responses. Experiential marketing theory, widely adopted in contemporary destination studies (Ngwira et al., 2023; Tang et al., 2023), emphasises that modern consumers seek meaningful experiences (Pine and Gilmore, 1998) rather than mere functional benefits, particularly relevant in post-pandemic tourism where destinations serve as experiential platforms (Oh et al., 2007). Social exchange theory applications in recent tourism contexts (Li et al., 2024; Yu et al., 2024; Gaonkar and Sukthankar, 2025) explain how host-guest interactions create mutual value through resource and cultural exchanges, building on established tourism foundations.

These theoretical foundations collectively suggest that destination satisfaction emerges through complex pathways where cognitive representations, environmental conditions, and social interactions influence tourist experiences, which subsequently determine satisfaction levels. However, contemporary tourism research demonstrates that the relative importance of these pathways varies significantly across different destination contexts (Buhalis et al., 2023; Matiza and Slabbert, 2024), requiring empirical investigation to establish boundary conditions for theoretical application.

2.2. Destination Brand Experience

Destination brand experience (DBE) captures tourists' multidimensional responses to destination encounters, with recent tourism applications (Shizhen et al., 2025; Abbasi et al., 2024) building on established brand experience frameworks (Brakus et al., 2009), traditionally encompassing sensory, affective, cognitive, and behavioural dimensions. Contemporary tourism conceptual developments (Ngwira et al., 2023; Guleria et al., 2023) have expanded DBE to include relational and spiritual dimensions, reflecting evolving tourist expectations for meaningful travel experiences in the post-pandemic era.

Recent tourism research positions DBE as a crucial mediating variable (Tang et al., 2023; Kim et al., 2025) that bridges destination stimuli and tourist outcomes within S-O-R frameworks. Contemporary tourism studies demonstrate that destination brand experiences contribute to satisfaction through both hedonic and eudaimonic pathways (Hosany et al., 2022), creating emotional and symbolic value that extends beyond functional utility (Pine and Gilmore, 1998). Latest tourism research indicates relationships

between DBE and satisfaction (Shizhen et al., 2025), loyalty (Abbasi et al., 2024), and advocacy behaviours (Qu et al., 2011) across diverse tourism contexts, though the specific antecedents and strength vary across destination types (Guleria et al., 2023).

2.3. Destination Brand Image

Destination brand image (DBI) represents tourists' mental associations and perceptions about a destination, with extensive recent tourism applications (Correia et al., 2025; Huerta-Álvarez et al., 2020) building on customer-based brand equity frameworks (Keller, 1993; Tasci, 2018), encompassing cognitive evaluations, affective responses, and overall impressions. Contemporary destination branding research (Alzaydi and Elsharnouby, 2023; Elgazzar et al., 2023) recognises DBI as a multidimensional construct incorporating factual knowledge, emotional connections, unique attributes, and holistic evaluations.

Recent tourism research demonstrates that strong destination images create expectations and perceptual frameworks that enhance tourists' receptivity to experiential stimuli (Bhandari et al., 2024). Latest digital tourism studies (Stojanovic et al., 2022) show fundamentally altered image formation processes through social media platforms and user-generated content (Correia et al., 2025), building on earlier foundations (Xiang and Gretzel, 2010). Contemporary tourism studies indicate that destination brand images function as cognitive schemas that guide subsequent experience interpretation and evaluation processes (Kumar and Kaushik, 2018), with image-experience relationship strength varying by destination characteristics and tourist motivations.

2.4. Tourism Service Environment

Tourism service environment (TSE) encompasses the totality of physical, social, technological, and institutional conditions that shape tourist experiences within destinations, with recent tourism applications (Buhalis et al., 2023; Lee and Jan, 2023) extending traditional servicescape frameworks (Bitner, 1992). Latest smart tourism research (Britt, 2023; Huang et al., 2023) incorporates artificial intelligence, IoT technologies, digital touchpoints, and sustainable destination management structures beyond traditional servicescape elements.

Contemporary tourism research demonstrates that superior service environments enhance tourist engagement across entertainment, education, escapism, and aesthetic domains (Jeong and Shin, 2020), building on experience economy perspectives (Pine and Gilmore, 1998). Recent tourism studies suggest that environmental factors create value through their contribution to sustainable experience design rather than simply through functional service delivery (Yu et al., 2023). However, latest tourism research shows that the relative importance of service environment factors varies across destination types, with nature-based contexts potentially prioritising environmental authenticity (Wang, 1999) over formal service delivery mechanisms.

2.5. Host-Guest Social Interaction

Host-guest social interaction encompasses formal and informal encounters between tourists and residents that contribute to destination experiences, with extensive recent tourism

applications (Li et al., 2024; Yu et al., 2024; Hu et al., 2024) building on social exchange theory (Ap, 1992) and contact theory foundations (Allport, 1954). Contemporary tourism research (Gaonkar and Sukthankar, 2025) recognises these interactions as multidimensional, varying in interaction quantity and quality dimensions, particularly in post-pandemic contexts.

Latest tourism studies indicate that meaningful host-guest interactions create value through cultural learning (Fan et al., 2017), authenticity enhancement (Wang et al., 2024), and emotional connection processes (Woosnam, 2012). Contemporary tourism research demonstrates that positive interactions can reduce cultural barriers through contact theory applications (Li et al., 2024) and emotional solidarity mechanisms (Yu et al., 2024; Tan and Hsu, 2024), influencing destination loyalty through relationship quality pathways. However, recent tourism studies show that the significance of social interactions depends on destination characteristics, tourist travel patterns, and tourism experience structures within specific contexts (Hu et al., 2024).

2.6. Destination Brand Satisfaction

Destination brand satisfaction (DBS) represents tourists' overall evaluative judgement regarding destination experiences, with extensive recent tourism applications (Kim et al., 2024; Matiza and Slabbert, 2024) building on expectancy-disconfirmation theory (Oliver, 1980), formed through comparison processes between expectations and perceived performance. Contemporary tourism conceptualisations (Walls et al., 2011) extend beyond functional satisfaction to encompass emotional and symbolic satisfaction dimensions reflecting experiential tourism consumption in digital-first environments.

Latest tourism studies demonstrate that destination brand experience significantly influences satisfaction formation through both direct and mediated pathways (Shizhen et al., 2025; Abbasi et al., 2024). Contemporary tourism research indicates that memorable tourism experiences contribute to satisfaction through affective events (Weiss and Cropanzano, 1996) and memory formation processes (Kim et al., 2024), with transformative experiences creating particularly strong satisfaction responses (Hosany et al., 2022). Building upon expectancy-disconfirmation applications in tourism (Oliver, 1980), recent research validates DBS as a predictor of loyalty, recommendation, and revisit intentions across cultural contexts (Yoon and Uysal, 2005; Chen and Chen, 2010; Stylos et al., 2021).

3. HYPOTHESES DEVELOPMENT

Recent research on destination brand experiences (Ngwira et al., 2023) indicates that positive destination images enhance tourists' receptivity to experiential stimuli, with effects particularly pronounced amongst first-time visitors who rely heavily on pre-formed images. Studies on user-generated content and destination image formation (Correia et al., 2025) show this relationship should be consistent across destination types, as image formation and experiential processing represent fundamental cognitive mechanisms in contemporary digital tourism environments. Based on these arguments, we propose:

H₁: Destination brand image positively influences destination brand experience.

Smart tourism research (Lee and Jan, 2023) demonstrates that destinations integrating digital technologies with physical infrastructure enhance tourist experiences across multiple domains, particularly in nature-based tourism contexts. Research on destination brand experiences (Ngwira et al., 2023) validates that superior service environments facilitate meaningful tourist engagement through both traditional and technological touchpoints. Contemporary studies on social media communication and tourism experiences (Abbasi et al., 2024) further indicate that well-designed service environments enhance tourist experiential value through multiple interaction channels. Following this reasoning, it is hypothesised that:

H₂: Tourism service environment positively influences destination brand experience.

Research on host-guest interactions (Su and Wall, 2010) demonstrates that meaningful tourist-resident interactions create value through cultural learning and emotional connection processes. Studies on tourist social contact (Fan et al., 2017) indicate that the significance of these interactions depends on tourist travel patterns, visit duration, and the structure of tourism experiences within specific destinations (Kim et al., 2020). This relationship is grounded in social exchange theory foundations (Bimonte and Punzo, 2016), which explains how interactions create mutual value through resource and cultural exchanges. Given these theoretical foundations, we predict:

H₃: Host-guest social interaction positively influences destination brand experience.

Contemporary research demonstrates strong relationships between destination brand experience and satisfaction across multiple tourism contexts (Kim et al., 2024), with memorable experiences serving as critical predictors of satisfaction formation. Studies on destination brand experience and citizenship behavior (Tang et al., 2023) show that affective experiential encounters accumulate to influence overall satisfaction judgements through both immediate emotional impact and memory processes. Research on memorable tourism experiences (Guleria et al., 2023) further validates that experiential quality serves as the primary driver of tourist satisfaction across diverse contexts. Consequently, the following relationship is proposed:

H₄: Destination brand experience positively influences destination brand satisfaction.

Studies on memorable tourism experiences and destination brand equity (Guleria et al., 2023) demonstrate that brand elements influence satisfaction primarily through their impact on experiential quality rather than through direct cognitive evaluations, with destination attachment and overall satisfaction mediating the relationship between memorable experiences and destination brand equity. Research on social media communication and brand equity (Abbasi et al., 2024) indicates that images create expectations that affect satisfaction through actual experiential encounters. Studies on user-generated content and destination image (Correia et al., 2025) further show that destination images influence satisfaction through

experiential mediation mechanisms. Therefore, we hypothesise:

H₅: Destination brand image influences destination brand satisfaction through destination brand experience mediation.

Studies on smart tourism experiences (Lee and Jan, 2023) demonstrate that technological integration enhances satisfaction primarily through improved experiential quality rather than simply operational efficiency, particularly in nature-based tourism settings. Research on destination brand experience and citizenship behavior (Tang et al., 2023) shows that service environments influence satisfaction through experiential enhancement mechanisms. Studies on memorable tourism experiences (Guleria et al., 2023) validate that service environment effects on satisfaction operate through experiential mediation pathways. Building on this logic, we propose:

H₆: Tourism service environment influences destination brand satisfaction through destination brand experience mediation.

Research demonstrates that interaction quality affects satisfaction through experiential enhancement mechanisms (Su and Wall, 2010). Studies on tourist social contact (Fan et al., 2017) indicate that meaningful social interactions contribute to satisfaction by facilitating cultural learning, authenticity perceptions, and emotional connections that enhance overall experiential quality. Research grounded in social exchange theory (Bimonte and Punzo, 2016) shows that host-guest interactions influence satisfaction through experiential pathway mechanisms rather than direct social exchange. Accordingly, the final hypothesis states:

H₇: Host-guest social interaction influences destination brand satisfaction through destination brand experience mediation.

4. RESEARCH METHODOLOGY

4.1. Research Design

This study employs a quantitative causal research design to examine structural relationships amongst destination brand image, tourism service environment, host-guest social interaction (antecedents), destination brand experience (mediator), and destination brand satisfaction (outcome). This approach enables analysis of both direct and mediated pathways within a complex theoretical framework, supporting the predictive and exploratory objectives of tourist behaviour research (Hair et al., 2021).

4.2. Population and Sample

The research was conducted across seven districts in Indonesia's Lake Toba Tourism Area: Simalungun, Karo, Dairi, Toba, Samosir, North Tapanuli, and Humbang Hasundutan. This destination offers rich natural and cultural tourism experiences recognised internationally for its geological and cultural significance, whilst representing a developing economy context where infrastructure development may lag behind natural asset quality (Rini et al., 2021). The target population comprised domestic tourists who visited the region within the past year. Purposive sampling selected respondents with direct experience of tourism services and local community interactions (Patton, 2015), whilst quota sampling ensured proportional geographic representation across districts (Tashakkori and Teddlie, 2010). The achieved sample of 350 respondents exceeds PLS-SEM guidelines for complex models

with five constructs and 25+ indicators, providing adequate statistical power whilst protecting against non-response bias (Hair et al., 2021; Kock and Hadaya, 2018).

4.3. Variable Measurement

A structured questionnaire comprised demographic questions and construct measurements using 5-point Likert scales (1 = Strongly disagree to 5 = Strongly agree), selected for optimal response discrimination whilst minimising respondent cognitive burden (Dawes, 2008). All constructs employed reflective indicators appropriate for measuring subjective perceptions and affective responses (Sarstedt et al., 2019). The Tourism Service Environment construct comprises five items measuring overall perceptions of service quality and environmental comfort, recognising that this may reflect both formal service delivery and basic infrastructure availability (Sipe and Testa, 2018). Destination Brand Image was operationalised through six items capturing cognitive, affective, and unique attractiveness evaluations (Qu et al., 2011). Host-Guest Social Interaction utilises five items assessing emotional, social, and personal quality of relationships with local communities (Wu et al., 2023). Destination Brand Experience encompasses seven items reflecting holistic sensory, emotional, and cognitive involvement during destination visits (Yu et al., 2024). Destination Brand Satisfaction was measured using four items evaluating overall judgements of tourism experiences (Shizhen et al., 2025). All instruments underwent content validity assessment by tourism and marketing experts following established protocols (Lynn, 1986; Polit and Beck, 2006), with construct validity and reliability subsequently evaluated through PLS-SEM measurement model testing.

4.4. Data Collection and Analysis

Primary data collection utilised on-site surveys across major tourist attractions, accommodation areas, terminals, and information centres. Fourteen trained enumerators were distributed proportionally across districts, ensuring geographic representativeness and measurement consistency through standardised protocols (Brunt et al., 2017; Fowler, 2014). Data collection occurred during April-May 2024 to maintain temporal consistency and control for seasonal variations (Malhotra et al., 2017). From 420 distributed questionnaires, 358 were returned (85.2% response rate), with 350 retained for analysis following rigorous validation procedures including completeness checks, straight-lining detection, and outlier identification (Hair et al., 2021).

Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed using SmartPLS 4 (Ringle et al., 2022), selected for its capability to handle complex models with multiple constructs, tolerance for non-normal distributions, and suitability for predictive research objectives. Analysis proceeded through measurement model assessment examining convergent validity, internal consistency, and discriminant validity, followed by structural model evaluation encompassing path coefficient estimation, explanatory power assessment, and comprehensive mediation analysis using bootstrapping with 5,000 subsamples (Hair et al., 2021; Hu and Bentler, 1999; Streukens and Leroi-Werelds, 2016).

5. RESULTS

5.1. Respondent Profile

Descriptive analysis of respondent characteristics (N = 350) reveals important contextual information for interpreting study findings. Comprehensive demographic and travel behaviour patterns are summarised in Table 1.

The sample comprised predominantly young (69.7% aged 18-35 years), highly educated (64.9% bachelor's degree or higher), first-time visitors (62.0%). Social media dominated information sources (51.8%), whilst nature-based activities and group travel patterns were prevalent. This demographic profile provides contextual foundation for understanding destination experience formation processes, particularly regarding the role of digital media in shaping initial perceptions among educated, technology-engaged tourists.

5.2. Data Quality Assessment

Independent sample t-tests comparing early (n = 117) and late (n = 233) respondents across all five constructs revealed no significant differences, indicating minimal non-response bias risk (Armstrong and Overton, 1977). Detailed non-response bias assessment results are reported in Table 2.

Harman's Single Factor Test demonstrated that the largest factor explained only 23.633% of total variance, well below the 50% threshold, confirming absence of significant common method variance (Podsakoff et al., 2003). The variance explained results are detailed in Table 3.

5.2.1. Measurement model evaluation

All measurement model criteria exceeded established thresholds (Hair et al., 2021). The comprehensive measurement model evaluation is reported in Table 4.

Table 1: Respondent profile

Characteristic	Category	Frequency	Percentage
Gender	Female	190	54.3
	Male	160	45.7
Age	18-25 years	109	31.1
	26-35 years	135	38.6
	36-45 years	61	17.4
	>45 years	45	12.9
Education	Secondary	45	12.8
	Diploma	78	22.3
	Bachelor's	168	48.0
	Postgraduate	59	16.9
Visit Frequency	First visit	217	62.0
	Repeat visit	133	38.0
Travel Status	Family	154	44.0
	Group	114	32.6
	Individual	82	23.4
Information Source	Social media	181	51.8
	Recommendations	92	26.3
Primary Activities	Travel websites	77	21.9
	Nature sightseeing	235	67.1
	Soft outdoor adventure	195	55.7
	Cultural tourism	145	41.4

Primary activities allowed multiple responses

Table 2: Non-response Bias Assessment

Variable	Group	N	Mean	SD	t	df	Sig (2-tailed)
Destination Brand Image	Early	117	3.453	0.424	-0.652	348	0.515
	Late	233	3.479	0.447			
Tourism Service Environment	Early	117	3.596	0.376	-0.51	348	0.611
	Late	233	3.582	0.371			
Host–Guest Social Interaction	Early	117	3.509	0.417	-0.577	348	0.564
	Late	233	3.531	0.404			
Destination Brand Experience	Early	117	3.623	0.358	0.194	348	0.846
	Late	233	3.615	0.377			
Destination Brand Satisfaction	Early	117	3.566	0.392	-0.429	348	0.668
	Late	233	3.585	0.368			

All P values > 0.05, indicating no significant differences between early and late respondents

Table 3: Common method variance assessment

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	7.562	23.633	23.633	7.562	23.633	23.633
2	3.121	9.754	33.387			
3	2.875	8.984	42.371			
4	2.314	7.232	49.603			
5	1.895	5.922	55.525			

Extraction Method: Principal Component Analysis Note: First factor explains <50% of variance, confirming no common method bias (Podsakoff et al., 2003)

Table 4: Measurement model assessment

Construct	Code	Outer loading	Cronbach's α	CR	AVE
Tourism Service Environment	TSE1	0.762	0.824	0.876	0.584
	TSE2	0.801			
	TSE3	0.778			
	TSE4	0.745			
	TSE5	0.790			
Destination Brand Image	DBI1	0.811	0.872	0.907	0.621
	DBI2	0.844			
	DBI3	0.799			
	DBI4	0.783			
	DBI5	0.828			
	DBI6	0.803			
Host–Guest Social Interaction	HGSI1	0.765	0.836	0.882	0.604
	HGSI2	0.787			
	HGSI3	0.741			
	HGSI4	0.756			
	HGSI5	0.772			
Destination Brand Experience	DBE1	0.812	0.894	0.922	0.628
	DBE2	0.834			
	DBE3	0.788			
	DBE4	0.802			
	DBE5	0.816			
	DBE6	0.829			
	DBE7	0.791			
Destination Brand Satisfaction	DBS1	0.851	0.861	0.906	0.710
	DBS2	0.864			
	DBS3	0.838			
	DBS4	0.820			

All thresholds met - Outer loadings > 0.70, Cronbach's α > 0.70, CR > 0.70, AVE > 0.50

Convergent validity was confirmed through outer loadings exceeding 0.70, composite reliability above 0.70, and Average Variance Extracted values above 0.50. Internal consistency was established via Cronbach's alpha values above 0.70. Discriminant validity was confirmed through both Fornell-Larcker criterion (Fornell and Larcker, 1981), HTMT ratios below 0.90 (Henseler et al., 2015). Discriminant validity assessment results are shown in Table 5.

Table 5: Discriminant validity assessment

Construct	DBI	TSE	HGSI	DBE	DBS
DBI	0.812	0.594	0.515	0.617	0.582
TSE	0.511	0.791	0.558	0.583	0.557
HGSI	0.438	0.472	0.804	0.603	0.572
DBE	0.547	0.498	0.523	0.837	0.679
DBS	0.504	0.476	0.498	0.605	0.829

Diagonal values (bold) = $\sqrt{\text{AVE}}$; Off-diagonal values=HTMT ratios. All HTMT < 0.90, confirming discriminant validity (Henseler et al., 2015)

Table 6: Hypothesis testing results

Hypothesis	Path relationship	(β)	t-statistic	P-value	Decision
H ₁	DBI → DBE	0.298	5.102	0.000	Supported
H ₂	TSE → DBE	0.067	1.324	0.186	Not supported
H ₃	HGSI → DBE	0.119	1.812	0.071	Not supported*
H ₄	DBE → DBS	0.459	6.845	0.000	Supported
H ₅	DBI → DBE → DBS	0.137	2.757	0.006	Supported
H ₆	TSE → DBE → DBS	0.031	1.011	0.312	Not supported
H ₇	HGSI → DBE → DBS	0.088	1.645	0.101	Not supported

H₃ is marginally significant (P<0.10). DBI: Destination Brand Image, DBE: Destination Brand Experience, TSE: Tourism Service Environment, HGSI: Host–Guest Social Interaction, DBS: Destination Brand Satisfaction

5.2.2. Structural model results

Bootstrap analysis with 5,000 subsamples revealed significant support for three of seven hypotheses. Hypothesis testing results are summarised in Table 6.

Destination brand image positively influenced destination brand experience (H₁: β = 0.298, P < 0.001), confirming the fundamental role of cognitive schemas in experiential processing. Destination brand experience demonstrated the strongest relationship with

destination brand satisfaction (H_4 : $\beta = 0.459$, $P < 0.001$), supporting experiential marketing theory predictions. The indirect effect from destination brand image to satisfaction through experience mediation was significant (H_5 : $\beta = 0.137$, $P = 0.006$), confirming S-O-R mediation mechanisms. Tourism service environment (H_2 : $\beta = 0.067$, $P = 0.186$) and host-guest social interaction (H_3 : $\beta = 0.119$, $P = 0.071$) did not significantly influence destination brand experience in this context. Correspondingly, their mediation effects on satisfaction (H_6 : $P = 0.312$; H_7 : $P = 0.101$) were non-significant, indicating limited contribution to satisfaction formation through experiential pathways in this specific destination context. Model explanatory power and predictive relevance indicators are presented in Table 7.

The model explained 30.5% of destination brand experience variance and 43.8% of destination brand satisfaction variance, representing moderate explanatory power appropriate for tourist behaviour research (Chin, 1998). Effect size analysis revealed destination brand image exerted small-to-medium influence on experience ($f^2 = 0.121$), whilst experience demonstrated medium-to-large effect on satisfaction ($f^2 = 0.287$). Predictive relevance was confirmed through positive Q^2 values exceeding 0.25 for both endogenous constructs.

6. DISCUSSION

The significant positive relationship between destination brand image and destination brand experience (H_1 : $\beta = 0.298$, $P < 0.001$) confirms that pre-visit cognitive schemas directly shape on-site experiential encounters across destination types. This finding supports established image-experience relationships in urban destination contexts (Qu et al., 2011; Barnes et al., 2014) whilst extending their applicability to nature-based settings where environmental features rather than built infrastructure create experiential foundations. The relationship gains particular significance given that 62.0% of respondents were first-time visitors heavily reliant on social media information sources (51.8%), demonstrating how digital image formation directly translates into experiential expectations and subsequent encounter interpretations (Correia et al., 2025; Xiang and Gretzel, 2010). The strong image-experience relationship confirms that consistent digital brand communication creates experiential receptivity frameworks that guide tourist attention and interpretation during actual destination visits, supporting customer-based brand equity principles where strong brand associations enhance experience quality (Keller, 1993).

The strongest relationship emerged between destination brand experience and satisfaction (H_4 : $\beta = 0.459$, $P < 0.001$), confirming that holistic experiential encounters rather than discrete service

evaluations determine tourist satisfaction in nature-based contexts. This finding supports experiential marketing theory positioning multi-sensory, emotional, and cognitive engagement as primary value creation mechanisms (Pine and Gilmore, 1998; Schmitt, 1999) rather than functional utility delivery. The relationship aligns with contemporary research demonstrating that memorable experiential moments create lasting satisfaction through emotional memory formation and personal meaning construction (Kim et al., 2024; Guleria et al., 2023). The finding emphasises that nature-based destination satisfaction emerges from cumulative experiential engagement with environmental features, social contexts, and personal discovery processes rather than from service provider performance evaluations, supporting experience-centric consumption patterns where tourists seek transformational rather than transactional value (Ngwira et al., 2023).

The significant mediation of destination brand image effects through experience (H_5 : $\beta = 0.137$, $P = 0.006$) confirms that cognitive inputs influence satisfaction through experiential processing rather than direct cognitive evaluation. This supports stimulus-organism-response theory applications demonstrating that environmental stimuli (destination images) influence internal states (experiential responses) which subsequently determine behavioural outcomes (satisfaction levels) (Jeong and Shin, 2020). The mediation mechanism operates consistently across destination contexts, confirming that tourists process satisfaction through experiential encounter quality rather than through direct comparison between expectations and objective destination attributes. This validates established theoretical frameworks about brand experience mediation where experiential quality serves as the primary pathway through which brand associations influence consumer outcomes (Brakus et al., 2009; Tang et al., 2023).

6.1. Comparison with Existing Literature and Contextual Variations

The non-significant relationship between tourism service environment and destination brand experience (H_2 : $\beta = 0.067$, $P = 0.186$) provides compelling empirical evidence that nature-based destinations create satisfaction through environmental authenticity rather than service quality excellence. This finding contrasts sharply with established service quality research demonstrating strong relationships between service environments and customer experiences (Parasuraman et al., 1988; Bitner, 1992), suggesting that tourists in nature-based contexts prioritise natural environment quality over formal service delivery. The divergence from urban destination research, where service quality typically demonstrates stronger experiential relationships (Qu et al., 2011; Lee and Jan, 2023), indicates that nature-based destinations generate satisfaction through direct environmental engagement rather than mediated service interactions.

Several specific contextual factors explain why nature-based destinations operate differently from urban destinations. With 67.1% of respondents engaging in nature sightseeing and 55.7% in soft outdoor adventures, tourists seek direct contact with natural environments rather than sophisticated service infrastructure. This pattern supports theoretical distinctions between environmental authenticity (direct nature contact) versus service authenticity

Table 7: Model assessment: Explanatory power and predictive relevance

Endogenous variable	R ²	Q ²	Antecedent → Endogenous	f ²	Effect size
DBE	0.305	0.251	DBI → DBE	0.121	Small-Medium
			TSE → DBE	0.015	Small
			HGSI → DBE	0.029	Small
DBS	0.438	0.392	DBE → DBS	0.287	Medium-Large

R² = coefficient of determination; Q² = predictive relevance; f² = effect size (Cohen, 1988)

(staged service experiences) in tourism contexts (Wang, 1999). Infrastructure limitations in developing economy contexts create tourist expectations focused on basic facility adequacy rather than service excellence, reducing the relative importance of traditional service quality indicators compared to developed country contexts where sophisticated service infrastructure is standard (Parasuraman et al., 1988).

Host-guest social interaction showed only marginal significance (H_3 : $\beta = 0.119$, $P = 0.071$), indicating that meaningful cultural exchange remains underdeveloped in current tourism patterns rather than being inherently unimportant. While some studies demonstrate significant positive effects through structured community programs (Li et al., 2024; Su and Wall, 2010), others find negligible impacts through spontaneous interactions (Fan et al., 2017), suggesting that interaction structure and duration determine effectiveness rather than interaction occurrence per se (Bimonte and Punzo, 2016). The marginal significance reflects specific structural constraints: family-focused travel patterns (44.0%) and group-oriented tourism (32.6%) create inward-looking social dynamics that limit openness to local community engagement, diverging from social exchange theory assumptions about tourist receptivity to host interactions (Ap, 1992).

The non-significant mediation effects for tourism service environment (H_6) and host-guest interaction (H_7) establish that service-dominant logic operates differently in nature-based versus urban contexts. Specifically, while service-dominant logic emphasises co-creation through service provider interactions (Vargo and Lusch, 2004), nature-based destinations create value through tourist-environment co-creation rather than tourist-service provider co-creation. This represents a shift from human-mediated value creation to environment-mediated value creation, supporting recent calls for destination-type-specific theoretical applications (Matiza and Slabbert, 2024) rather than universal framework adoption across all tourism contexts.

6.2. Alternative Explanations and Theoretical Boundary Conditions

Several specific methodological explanations merit consideration for the non-significant service environment findings (H_2) beyond theoretical differences. The service environment construct may be inappropriate for measuring developing economy tourism infrastructure, where basic facility availability (electricity, water, accessibility) becomes more salient than advanced service features (ambiance, technology, staff training). Limited service infrastructure development in the Lake Toba region may have created restricted measurement variance, with most facilities offering similar basic service levels rather than the quality differentiation that enables statistical relationship detection. This measurement limitation reflects broader challenges in applying service quality instruments developed for high-infrastructure contexts to developing economy destinations.

The developing economy context introduces specific operational constraints that may not apply to nature-based destinations in developed economies. Infrastructure limitations create tourist adaptation strategies where visitors adjust expectations downward

for service quality while maintaining high expectations for environmental quality. Resource constraints limit destination ability to provide sophisticated service infrastructure, creating tourist satisfaction dependence on natural asset quality rather than service delivery excellence. Tourist expectation patterns in developing economies focus on value-for-money and basic facility adequacy rather than service innovation and personalisation, differing fundamentally from developed country tourism expectations where service excellence differentiates competitive positioning (Parasuraman et al., 1988).

The domestic tourist sample exhibits specific cultural and economic characteristics that may not generalise to international visitor patterns. Cultural familiarity reduces domestic tourist dependence on formal service guidance and support, as local knowledge enables independent navigation and problem-solving that international tourists typically require through service provision. Economic constraints of domestic tourism create price-sensitive behavior where tourists prioritise cost savings over service quality, accepting basic service levels in exchange for affordable access to natural attractions. This domestic tourist profile differs substantially from international tourism research contexts where visitors typically possess higher spending power and service quality expectations (Fan et al., 2017).

The marginal significance of host-guest interactions (H_3) reflects specific structural tourism constraints rather than theoretical relationship absence. Brief visit durations (typically 1-2 days for domestic Lake Toba tourism) provide insufficient time for relationship development beyond superficial commercial transactions. Group travel dominance creates tourist group self-sufficiency that reduces motivation for external local engagement, as group members provide mutual support and social interaction. Tourism activity structures emphasise scheduled sightseeing and photography rather than cultural immersion activities that would facilitate meaningful host-guest interaction. These structural constraints prevent the relationship development opportunities that social exchange theory assumes as prerequisites for meaningful interaction effects (Ap, 1992; Li et al., 2024).

The moderate explanatory power (30.5% for experience, 43.8% for satisfaction) indicates specific unmeasured factors that influence nature-based tourism satisfaction. Weather conditions and seasonal variations significantly impact nature tourism experiences but were not captured in this cross-sectional study. Individual environmental sensitivity and nature appreciation orientations likely moderate tourist responses to natural settings but were not measured. Group dynamics and travel companion relationships influence social aspects of tourism experiences beyond host-guest interactions. Destination accessibility and travel effort may create investment effects where difficult-to-reach destinations generate higher satisfaction through achievement feelings.

These specific explanations highlight that the findings reflect measurable contextual constraints rather than theoretical framework inadequacy. The results should be interpreted as evidence for destination-type-specific satisfaction drivers rather than general service-dominant logic rejection. This interpretation

supports theoretical refinement through contextual application rather than fundamental theory revision, consistent with calls for destination typology-specific research approaches in contemporary tourism studies.

7. CONCLUSION

This study provides empirical evidence for contextual variations in destination satisfaction mechanisms, demonstrating that while fundamental cognitive and experiential processes operate consistently across destination types, the relative importance of different antecedent factors varies significantly depending on destination characteristics and contextual conditions.

Key findings reveal that destination brand image serves as the primary driver of experiential outcomes, whilst traditional service environment factors show limited influence in this nature-based context. The strongest relationship emerged between destination brand experience and satisfaction, confirming that experiential encounters serve as the primary satisfaction driver regardless of destination type. These findings support image-experience-satisfaction pathways whilst establishing important boundary conditions for service-dominant logic application.

The study's primary contribution lies in establishing when and where service-dominant logic may have limited explanatory power in nature-based destinations. Rather than proposing entirely new theoretical frameworks, the research refines understanding of contextual variations where environmental authenticity and experiential engagement supersede traditional service delivery concerns. This is particularly relevant for nature-based destinations in developing economies where infrastructure development may lag behind natural asset quality.

7.1. Theoretical Implications

This research extends destination branding theory by establishing boundary conditions for service-dominant logic application in nature-based contexts. The findings demonstrate that traditional service quality frameworks may have limited explanatory power where: environmental authenticity supersedes service standardisation; infrastructure limitations create different expectation frameworks; and tourist motivations prioritise experiential over functional benefits.

The study confirms that image-experience-satisfaction pathways operate consistently across destination contexts, supporting fundamental S-O-R mechanisms. However, service environment and social interaction effects vary significantly depending on contextual factors, indicating important limitations for universal application of established theories. This establishes crucial boundary conditions whilst highlighting the need for context-sensitive applications of destination branding frameworks.

7.2. Practical Implications

For destination managers in nature-based contexts, these findings provide evidence-based guidance prioritising authentic branding and experiential design over traditional service infrastructure development. Investment should emphasise environmental

preservation, accessibility enhancement, and interpretive experiences rather than conventional hospitality infrastructure expansion, supporting sustainable tourism development that maintains destination authenticity.

Digital marketing strategies should prioritise visual storytelling and emotional connection, ensuring consistency between digitally-mediated expectations and actual environmental encounters. With social media dominating information sources among the surveyed tourists, maintaining this alignment becomes critical for destination success.

The limited impact of host-guest interactions indicates substantial potential for enhanced community engagement through structured programs. Community-based tourism initiatives facilitating meaningful cultural exchange could strengthen this currently underutilised satisfaction driver, particularly given the brief visit durations and group travel patterns typical of domestic tourism.

For policy makers, the findings suggest that nature-based destinations require different development approaches compared to urban destinations, with traditional service quality improvement models being less effective than investments in environmental authenticity preservation and experiential encounter design.

7.3. Limitations and Future research directions

Several research opportunities emerge from this study's findings and limitations. Cross-destination validation should examine these relationships across multiple nature-based destinations to establish broader generalisability and identify which contextual factors most strongly influence satisfaction mechanism variations. Comparative studies addressing the single-destination limitation could enhance theoretical robustness.

Cultural boundary conditions require investigation through studies comparing domestic and international tourist responses, as different cultural backgrounds may exhibit varying expectation patterns. Longitudinal research could track how satisfaction mechanisms evolve as destinations develop infrastructure and tourism maturity.

The marginal significance of host-guest interactions suggests investigating how structured community-based tourism programming influences tourist experiences. Mixed-methods approaches combining quantitative relationship testing with qualitative exploration could provide deeper insights into experiential meaning construction and contextual variation mechanisms.

Methodological refinements should address service environment measurement limitations in developing economy contexts. Research examining the adaptation of service quality constructs for infrastructure-limited settings could enhance theoretical applicability whilst addressing potential measurement artifacts.

As destinations globally navigate post-pandemic recovery whilst addressing sustainability imperatives, understanding contextual variations in satisfaction mechanisms becomes crucial for

developing tailored destination management strategies. This research demonstrates the value of examining established theories within specific contexts, providing a foundation for cumulative theory building in tourism studies.

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