

TOURIST PERCEPTIONS AND SERVICE DESIGN FOR SUSTAINABLE COMMUNITY FORESTS

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ABSTRACT

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This study investigates tourist perceptions and service design at Suan Pa Ket Nom Klao, a peri-urban community forest in Samut Prakan, Thailand. The research aims to enhance visitor experiences while promoting sustainable tourism, inclusive access to green spaces, and responsible consumption. Guided by User Experience (UX) theory, the Tourist Experience Model, and the Triple Bottom Line (TBL) framework, the study adopts a multidimensional approach to ecotourism development. Three key objectives were pursued: (1) to evaluate visitors' perception and activity categorization, (2) to examine relationships among tourist experience dimensions, and (3) to compare three thematic models—ecology, culture and art, and wellness—based on visitor preferences. Following the implementation of low-impact tourism interventions, including forest walkways, stingless bee displays, and eco-friendly souvenir services, a cross-sectional survey was conducted with 128 visitors. Findings reveal that visitors reported higher satisfaction with wellness and cultural activities than with ecological ones. Learning opportunities and perceived service quality were strongly linked to overall satisfaction. Although ecological activities were appreciated, they require improved interactive engagement and more diverse souvenir offerings. The resulting integrated framework offers a practical guide for aligning service design with ecological stewardship, cultural enrichment, and economic sustainability.

Keywords: Community forest; sustainable tourism; tourist experience; service design

1. INTRODUCTION

Community forests—locally managed landscapes that balance conservation with livelihood development—are increasingly recognized as important ecotourism destinations in Thailand and internationally (Bruce, 1989; RECOFTC, 2021). These areas foster biodiversity and community engagement, while also supporting local economies through sustainable tourism. In these contexts, understanding tourist perceptions is critical, as visitor interpretations of environmental, cultural, and service-related attributes directly influence experience quality and the sustainability of tourism development.

Suan Pa Ket Nom Klao, located in the Songkhanong subdistrict of Samut Prakan province (Figure 1), exemplifies this model. Situated only 20 kilometers from central Bangkok, it offers a green refuge in a rapidly

urbanizing region and serves as a platform for sustainable tourism within a community-managed natural setting. Historically, the site has undergone ecological restoration supported by the Chaipattana Foundation, transforming former coconut trench farms into a thriving forest ecosystem (Chaipattana Foundation, n.d.). This recovery has been bolstered by Corporate Social Responsibility (CSR) initiatives, reflecting a growing trend of private-sector involvement in community-based environmental restoration (Sattayapanich et al., 2022).

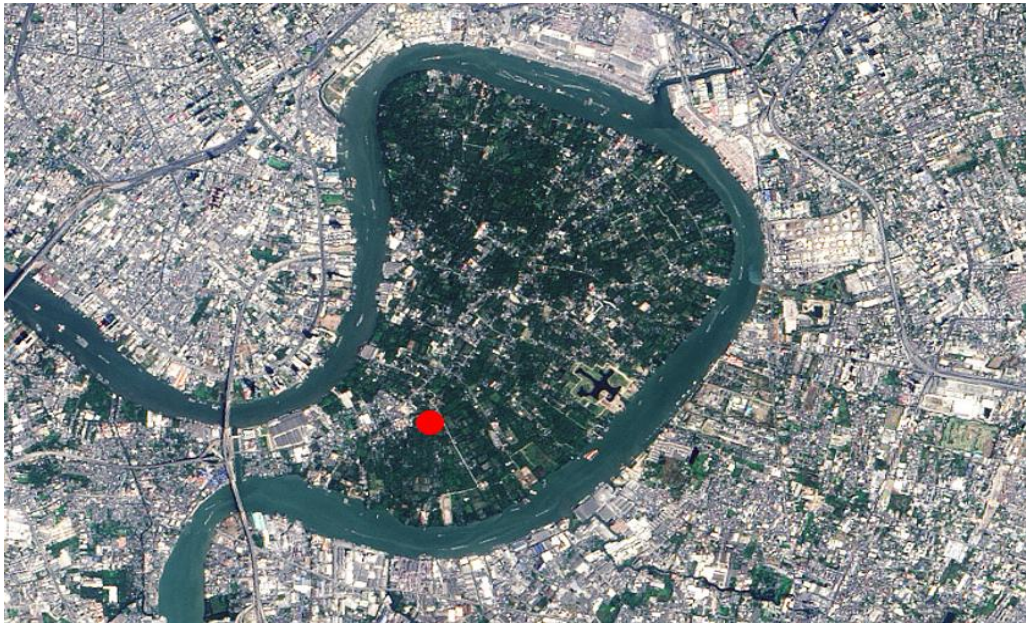


Figure 1: The location of Suan Pa Ket Nom Klao within the Bang Kachao peninsula, Samut Prakan (Google, n.d.)

Today, the forest integrates conservation with local livelihood activities. Key to its service design are offerings such as wellness services (e.g., foot massages by village health volunteers) and eco-friendly tie-dye workshops that merge cultural heritage with environmental awareness. Despite these strengths, the site faces challenges typical of peri-urban forests, including limited ecological distinctiveness and financial constraints (Wanitchakorn & Muangasame, 2021). Consequently, tourism has become a vital revenue stream for sustaining forest management.

A significant research gap remains regarding how tourists perceive hybrid environments in which ecological, cultural, and service dimensions intersect. In developing a distinct forest identity, three thematic approaches have emerged: ecology, culture and art, and wellness. These themes function not only as development strategies but also as perceptual frameworks through which visitors interpret their experience. For example, Ban Pa Miang in Lampang emphasizes biodiversity and trekking activities (Wisaratana & Nicrothanont, 2021), while the Wounaan people of Panama integrate traditional art into forest governance practices (French, 2021). Similarly, wellness-oriented models such as forest bathing are gaining recognition in Thailand (Park et al., 2010; Ito et al., 2023).

While existing literature has explored ecological and cultural foundations of forest identity, there is limited understanding of how these elements interact with emerging wellness and experiential tourism themes. Ecological studies often isolate biodiversity and restoration from socio-cultural dimensions (Pragtong & Thomas, 1990), while cultural research rarely connects heritage practices to livelihood strategies or visitor engagement.

This study explores visitor engagement and preferences through three objectives:

1. To evaluate user perception and categorization of key activities,
2. To examine the relationships among various aspects of the tourist experience,
3. To compare distinct thematic models—wellness, culture and art, and ecology—based on visitor preferences.

The ultimate aim of these strategies is to cultivate a distinct identity for Suan Pa Ket Nom Klao while optimizing tourism services to bolster local income, environmental awareness, and long-term sustainability. To achieve this, the study adopts an integrated conceptual framework that links tourist perceptions with experience design and sustainability outcomes. This approach allows for a holistic evaluation of how service-led interventions can bridge the gap between ecological conservation and meaningful visitor engagement in community forest contexts.

2. INTEGRATED THEORETICAL FRAMEWORK

This study develops a framework combining User Experience (UX) theory, Tourist Experience models, and the Triple Bottom Line (TBL) approach. Within this structure, UX theory explains the formation of perceptions through interaction, the Tourist Experience Model operationalizes these perceptions into measurable dimensions (learning, satisfaction, intention), and the TBL contextualizes these outcomes within the sustainability objectives of community forests.

UX theory offers insights into the emotional and cognitive responses that guide service design to enhance satisfaction and engagement (Hassenzahl, 2010). Complementary tourist experience models identify critical dimensions such as learning, service quality, and cultural engagement that foster visitor loyalty (Genc & Gulertekin Genc, 2023). Finally, the TBL framework ensures that service design aligns with social equity, environmental stewardship, and economic sustainability, addressing the practical challenges of converting ecological efforts, such as carbon sequestration, into tangible community benefits (Elkington, 1997). Tourist perceptions are operationalized through two interrelated components: (1) thematic interpretation of the forest experience (ecology, culture and art, and wellness), representing the cognitive dimension, and (2) experiential evaluation (learning, service quality, accessibility, satisfaction, and behavioral intention), representing affective and behavioral dimensions. Together, these frameworks provide a comprehensive lens to bridge existing gaps in understanding visitor diversity and lifestyle preferences, supporting sustainable tourism development.

Despite the growing recognition of UX in ecotourism research, there remains a lack of detailed understanding of the diverse visitor personas and their lifestyle preferences, particularly in peri-urban community forests like Suan Pa Ket Nom Klao, where limited ecological distinctiveness can hinder the formation of a strong, competitive destination identity (Kontogeorgopoulos, 2005). Furthermore, current research often overlooks the integration of cultural and environmental learning into service evaluation and fails to adequately link environmental stewardship efforts such as carbon footprint reduction with economic gains for local communities. In addition, existing studies often apply UX, tourist experience models, and sustainability frameworks in isolation, resulting in fragmented interpretations of visitor behavior and perception. These gaps highlight the necessity of a user-centered, sustainability-integrated framework that combines these three concepts to inform experience design, improve service quality, and secure economic viability in peri-urban ecotourism settings. To strengthen analytical coherence, this study integrates these frameworks into a unified structure in which UX explains perception formation, tourist experience models define measurable dimensions, and TBL contextualizes outcomes within the sustainability objectives of community forests.

2.1 User experience (UX) theory

UX theory examines emotional, cognitive, and behavioral reactions to environmental interactions, shaping perceptions of Suan Pa Ket Nom Klao as an ecotourism site (Hassenzahl, 2010; Norman, 2005). Within this study, UX theory explains how interactions with designed elements and community-based services contribute to the formation of tourist perceptions in a community forest context. International tourists value ecological authenticity such as forest paths and bee displays. Student groups prefer cultural engagement through hands-on tie-dye workshops that enhance learning. CSR participants focus on ecological contributions like planting native species. These distinct visitor personas—nature seekers, cultural learners, and ecological contributors—represent different modes of perception shaped by varying motivations and interactions with the community forest environment and highlight the need for tailored services to boost satisfaction.

2.2 Tourist experience model

Tourist experience involves visitors' cognitive (learning), affective (satisfaction), and behavioral (revisit intention) responses. Destination identity is defined as the unique features and narratives that attract and retain visitors (Chang & Hung, 2021). In this study, these dimensions are used to operationalize tourist perceptions, translating abstract perceptual constructs into measurable variables. In addition, the Theory of Planned Behavior (TPB) suggests that attitudes formed through positive tourism experiences can influence behavioral intentions such as revisit intention and pro-environmental behavior (Ajzen, 1991). This perspective supports the interpretation that learning, service quality, and environmental engagement contribute not only to visitor satisfaction but also to future behavioral outcomes. Suan Pa Ket Nom Klao's identity is strengthened through ecology, culture, and wellness activities which are critical in peri-urban settings with limited ecological authenticity. Learning, service quality, and environmental engagement drive satisfaction and loyalty (Suksri et al., 2021; Ap & Wong, 2001). Facilities and accessibility support comfort and inclusivity (Darcy & Dickson, 2009). Souvenirs contribute to emotional attachment but to a lesser extent (Swanson & Timothy, 2012).

Cultural differences affect preferences; Asians tend to favor communal activities, while Westerners seek ecological authenticity (Genc & Gulertekin Genc, 2023).

2.3 Triple bottom line framework

The TBL framework evaluates sustainability across three pillars: social (people), environmental (planet), and economic (profit) (Elkington, 1997). In tourism planning, TBL facilitates development that is economically viable, socially equitable, and ecologically responsible. Within community forests, these dimensions are closely linked to participatory governance, local stakeholder engagement, and livelihood-based services, which directly influence how tourist perceptions are formed and evaluated. However, generating income directly from forest resources is challenging, with communities often relying on service-based activities because monetizing carbon credits remains difficult. The difficulty of monetizing carbon is a regional challenge, as evidenced by similar complexities found in China's Yellow River Basin. Although low-carbon tourism is receiving increased attention, mechanisms to translate carbon reductions into tangible economic benefits such as carbon credits are underdeveloped, limiting opportunities for communities to leverage these initiatives for income generation (Si & Tang, 2024).

Overall, the integration of UX theory, the Tourist Experience Model, and the TBL framework positions tourist perceptions as the central construct linking visitor interaction, experiential evaluation, and sustainability outcomes. UX explains how perceptions are formed through interaction, the Tourist Experience Model structures how they are measured, and TBL contextualizes their broader significance within the socio-ecological system of community forests. This integrated approach addresses fragmentation in previous studies and provides a coherent basis for analyzing tourist perceptions in this research (Figure 2).

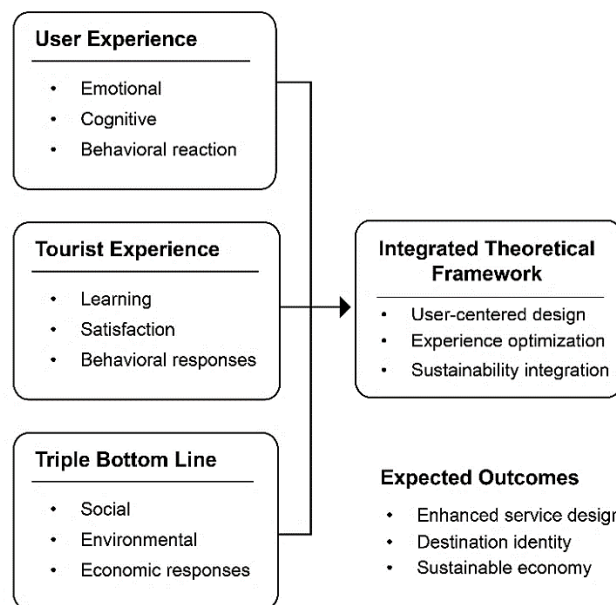


Figure 2: Integrated conceptual framework for service design in peri-urban community forests, linking User Experience (UX), Tourist Experience dimensions, and Triple Bottom Line (TBL) sustainability outcomes.

3. METHODOLOGY

This study employed a quantitative approach combining design interventions with survey analysis to evaluate tourist perceptions of enhanced experiences at Suan Pa Ket Nom Klao. Focus was placed on three thematic tourism models—ecology, culture and art, and wellness—to examine their effects on visitor satisfaction and revisit intention. The methodology integrates sustainable tourism principles, emphasizing ecological integrity and community participation.

3.1 Research design

A post-intervention design was used, in which targeted design interventions aimed at improving the tourist experience were implemented, followed by a cross-sectional survey to assess visitor perceptions. The interventions were developed through participatory workshops with local stakeholders to ensure community alignment. The survey sampled tourists who engaged with the redesigned experiences, measuring perceptions across the three thematic models and key dimensions such as learning and service quality.

3.2 Design interventions

To enhance the tourism potential of Suan Pa Ket Nom Klao, a series of low-impact design interventions (Figure 3) were implemented over a three-month period. The design interventions were developed through participatory workshops with local stakeholders, including community leaders, village health volunteers, and local artisans. This collaborative process ensured that the interventions aligned with community forest principles of participatory governance and local ownership. Guided by User Experience (UX) theory to optimize visitor satisfaction through aesthetic and functional enhancements (Hassenzahl, 2010), and the Triple Bottom Line (TBL) framework to ensure social, environmental, and economic sustainability (Elkington, 1997), design considerations also incorporated perceived service quality, aiming to strengthen both cognitive and affective visitor engagement.

- Leaf-Patterned Entrance Door: A decorative entrance gate was installed to shorten the walking distance and create a visually distinct welcome, aligning with UX principles for emotional engagement.
- Forest Walk Pathway: Upgraded pathways with clearer routes and native plant landscaping improved accessibility and immersion.
- Wayfinding Signage: Eco-friendly signage facilitated navigation, enhancing UX accessibility and TBL's environmental pillar.
- Stingless Bee Learning Display: A bee house provided educational content on pollination, fostering cognitive engagement per tourist experience models
- Souvenir Kiosk: A portable kiosk with eco-friendly products reflected local culture, supporting TBL's social and economic pillars
- Carbon Footprint Labels: Labels promoted environmental awareness, aligning with TBL's environmental goals.



Figure 3: Service design interventions implemented at Suan Pa Ket Nom Klao: (a) leaf-patterned entrance door; (b) upgraded forest walk pathway; (c) low-impact wooden wayfinding signage; (d) interactive stingless bee learning display; (e) mobile souvenir kiosk; and (f) carbon footprint labels.

The implementation of these interventions faced significant challenges due to Department of Forestry regulations prohibiting permanent structures on community forest lands. To ensure full compliance, the design process prioritized mobile and temporary solutions, such as the portable souvenir kiosk and wooden signages. Furthermore, to overcome budget constraints and foster long-term sustainability, CSR partnerships supplemented funding for materials, while local artisans were trained to maintain the features. This training fostered community ownership and enhanced capacity, ultimately ensuring that these interventions improved the visitor experience while respecting the forest's primary role in ecological restoration.

3.3 Data collection and sample

This study targeted tourists visiting Suan Pa Ket Nom Klao during March and April 2024, following the implementation of design interventions. A convenience sample of 128 respondents was recruited to reflect diverse visitor perspectives, including CSR participants, international visitors, and educational study groups (Table 1). To ensure valid assessments, eligible participants were required to have engaged with all redesigned activities. The resulting sample was female-majority (57.813%) with a distinct age distribution favoring young adults (18–24; 40.625%) and seniors (55+; 24.219%). Domestic Thai tourists comprised 40.625%, followed by other Asian tourists (28.125%) and Western visitors (31.25%). CSR groups were the dominant visitor segment at 50.781%, and most respondents (78.906%) reported limited (1–2 years) experience with forest tourism. Data were analyzed using descriptive statistics, one-way ANOVA, and correlation analysis.

Table 1: Demographic and behavioral profile of respondents (n = 128)

	Categories	n	%
Gender	Female	74	57.813
	Male	53	41.406
	Other / prefer not to say	1	0.781
Age group	18–24	52	40.625
	25–34	20	15.625
	35–44	16	12.500
	45–54	9	7.031
	55–64	4	3.125
	65 and above	27	21.094
Nationality	Thai	52	40.625
	Asian	36	28.125
	Western	40	31.250
Tourist type	CSR	65	50.781
	International tourist	36	28.125
	Study group	27	21.094
Forest tourism experience	1–2 years	101	78.906
	3–4 years	10	7.813
	More than 5 years	17	13.281

Data were collected through a structured questionnaire comprising 31 items, designed to measure perceptions of the three thematic models (ecology, culture and art, wellness) and key experience dimensions, including service quality, souvenir appeal, facility adequacy, accessibility, learning, satisfaction, and revisit intention (Table 2). Items were adapted from established tourism research (Chang & Hung, 2021; Constantin et al., 2022; Nguyen Huu et al., 2024), and responses were rated on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). To reduce bias, the questionnaire included both positively and negatively worded items. Negative items were reverse-scored so that higher values consistently indicate positive perceptions.

The surveys were administered in person by trained volunteers immediately following the visit, allowing participants to reflect on their experiences while still on site. The questionnaire was provided in both Thai and English, and the translations were cross-checked by bilingual translators to ensure linguistic accuracy and conceptual equivalence.

Table 2: Operationalization of research variables and questionnaire items for thematic models (Q1–Q9) and tourist experience dimensions (Q10–Q31)

Ecology (Q1, Q2, Q3)	Facilities (Q16, Q17, Q18)
Q1: "You chose this community forest because of its natural beauty and outdoor activities." Q2: "Experiencing the natural environment is not a primary reason for your visit." Q3: "You are interested in learning about the local plants during your visit."	Q16: "Facilities like restrooms and learning areas were not clean and were not well-maintained." Q17: "Availability of facilities like seating and shaded areas improved the visit." Q18: "The community forest did not provide sufficient signs and information at various points."
Culture and Art (Q4, Q5, Q6)	Accessibility (Q19, Q20, Q21)
Q4: "You are visiting this community forest without an interest in the local art and cultural heritage." Q5: "Participating in cultural activities and events is an important part of your visit." Q6: "You are not interested in learning about the traditional practices and crafts of the local community."	Q19: "The community forest was easily accessible with clear directions." Q20: "The trails and paths were not suitable for visitors of all abilities." Q21: "Transportation options to and from the community forest were convenient."
Wellness (Q7, Q8, Q9)	Learning (Q22, Q23, Q24)
Q7: "You chose this community forest for its opportunities to engage in health and wellness activities." Q8: "Participating in activities that promote physical and mental health is not something you are interested in." Q9: "The forest offers a tranquil environment that supports your health and relaxation goals."	Q22: "The learning programs offered in the forest lack sufficient substance to be engaging." Q23: "You learned a lot about sustainability and conservation efforts." Q24: "Participating in various activities did not add much value to your visit."
Service (Q10, Q11, Q12)	Satisfaction (Q25, Q26, Q28)
Q10: "The community forest staff were not helpful and lacked knowledge." Q11: "Tour guides provided comprehensive information about the forest and sustainability efforts." Q12: "You are dissatisfied with the overall quality of service during your visit."	Q25: "Overall, you were satisfied with your visit to the community forest." Q26: "The overall experience you had in the community forest did not satisfy you." Q28: "Activities and services met your expectations."
Souvenirs (Q13, Q14, Q15)	Intention (Q27, Q29, Q30, Q31)
Q13: "There was a good selection of eco-friendly souvenirs available for purchase." Q14: "Souvenirs were not meaningful and did not reflected local products." Q15: "Purchasing souvenirs contributed to an overall good experience."	Q27: "You have no intention of adopting sustainable practices in your daily life, such as reducing waste and recycling." Q29: "You plan to adopt sustainable practices in daily life (e.g., reducing waste, recycling)." Q30: "You intend to support environmental conservation and sustainability in your community." Q31: "You do not want to plan to revisit the community forest to learn more about environmental conservation and sustainability."

4. RESULTS

4.1 User perception

A clear cognitive distinction emerged between observational forest activities and interactive community-based services. Six key activities: forest walk, bee demonstration, entrance photography, souvenir shopping, herbal oil making, and herbal compress preparation were evaluated to determine their cognitive alignment with the three thematic models (Figure 4).

The data revealed a strong consensus for "Passive Ecology" in nature-based activities, whereas interactive sessions triggered more diverse socio-cultural interpretations. The forest walk was predominantly viewed as ecology-based (93.75%), while the bee demonstration was perceived as primarily ecological (81.25%); however it also exhibited significant perceptual variation across visitor groups. Analysis by visitor type revealed that study groups perceived the bee demonstration as significantly more artistic ($M = 1.38$, $SD = 0.68$) than did international tourists ($M = 1.08$, $SD = 0.28$; $p = .032$). By nationality, a distinct pattern showed that Asian tourists rated the bee demonstration as more artistic ($M = 1.48$) than Western ($M = 1.08$) and Thai ($M = 1.21$) groups ($p = .030$ and $p = .027$, respectively).

Similarly, a high thematic alignment was observed for culture and wellness: Entrance photography (81.25%) and souvenir shopping (90.625%) were strongly associated with the culture and art model, while herbal oil making (75%) and herbal compress preparation (80.469%) were primarily viewed as wellness activities. These findings illustrate that visitors construct distinct cognitive meanings in which interpretations are significantly shaped by individual socio-cultural backgrounds.

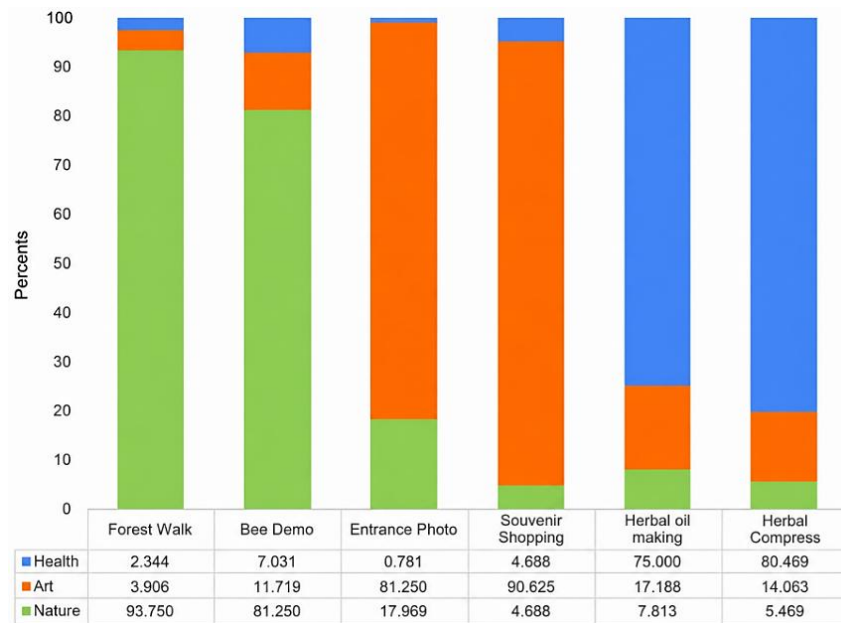


Figure 4: Cognitive categorization of community forest activities: Percentage distribution of visitor perceptions across Ecology, Culture and Art, and Wellness themes (n = 128).

4.2 Evaluation of thematic models

Affective evaluations indicated a consistent preference for experiential and service-oriented themes over passive ecological engagement. Mean scores for the thematic models (Q1–Q9) indicated notable variation, with the wellness model receiving the highest rating ($M = 4.17$, $SD = 0.93$), closely followed by culture and art ($M = 4.16$, $SD = 1.07$). In contrast, the ecology model was rated significantly lower ($M = 3.93$, $SD = 1.04$). One-way ANOVA confirmed that the preference for ecology was significantly lower than for both culture and art (mean difference = -0.23 , $p = .005$) and wellness (mean difference = -0.24 , $p = .003$). There was no significant difference between culture and art and wellness ($p = .994$). This consistent 5–6% perception gap suggests that ecology-based activities, such as the forest walk, require functional enhancements such as guided tours or native plant workshops to elevate engagement in this peri-urban context.

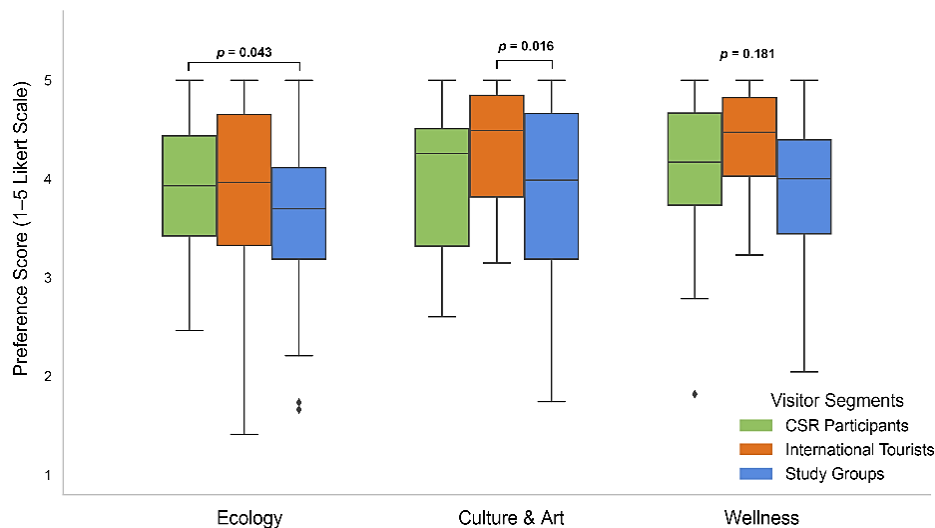


Figure 5: Distribution of thematic model preferences by visitor segments. Brackets indicate statistically significant post-hoc pairwise comparisons. No pairwise comparison is displayed for the Wellness model because the overall group difference was not statistically significant ($F = 1.73$, $p = .181$).

Furthermore, a pattern of “visitor-specific preference” (Figure 5) was identified: For the ecology model ($F = 3.18$, $p = .045$), CSR participants rated the theme significantly higher ($M = 4.13$) than study groups ($M = 3.73$, $p = .043$). The culture and art model also exhibited demographic variance ($F = 3.99$, $p = .021$), with international

tourists exhibiting a higher preference ($M = 4.36$) than study groups ($M = 3.91, p = .016$). Notably, the wellness model showed no significant variation ($F = 1.73, p = .181$), suggesting a relatively consistent appeal as a core service pillar.

4.3 Tourist experience

Analysis of service dimensions revealed that service quality and learning are the primary drivers of satisfaction and behavioral intention. Mean scores for tourist experience (Q10–Q31) revealed critical performance strengths and areas for improvement. Service quality emerged as the highest-performing dimension ($M = 4.48, SD = 0.70$), with strong performance in staff assistance (Q10, $M = 4.55$) and responsiveness (Q12, $M = 4.52$), though tour guide information (Q11, $M = 4.37$) suggested room for enhancing sustainability communication. Educational value also served as a major engagement driver, with learning experiences rated highly ($M = 4.15, SD = 0.73$), particularly for engagement (Q22, $M = 4.32$), indicating strong educational value from activities like the bee demonstration.

While satisfaction was consistently high ($M = 4.41, SD = 0.56$), with the overall experience (Q28, $M = 4.50$) exceeding expectations. Infrastructure dimensions showed room for improvement: Facilities ($M = 4.07, SD = 0.76$) were generally adequate, though restroom cleanliness (Q16) required attention. Revisit intention and eco-friendly behavior ($M = 4.14, SD = 0.76$) were promising, especially willingness to revisit (Q27, $M = 4.40$), while conservation volunteering (Q30, $M = 3.72$) was less appealing. Accessibility ($M = 3.86, SD = 0.77$) posed challenges, particularly for mobility-impaired visitors (Q20). Souvenirs received the lowest overall rating ($M = 3.96, SD = 0.80$), with limited variety (Q13, $M = 3.91$), despite high scores for cultural representation (Q14, $M = 4.23$). These results indicate that affective evaluations are strongly influenced by service and learning dimensions, which serve as key drivers of overall perception.

Table 3: Correlation matrix of perceived service and tourist experience dimensions

	Service	Learning	Facility	Accessibility	Souvenir	Satisfaction	Intention
Service	1						
Learning	.635***	1					
Facility	.613***	.604***	1				
Accessibility	.455***	.503***	.560***	1			
Souvenir	.453***	.496***	.430***	.462***	1		
Satisfaction	.618***	.630***	.515***	.524***	.384***	1	
Intention	.400***	.535***	.338***	.378***	.432***	.472***	1

Correlation analysis showed significant positive relationships among all experience dimensions ($p < .001$), reinforcing that positive affective evaluations translate into future-oriented actions (Table 3). The strongest correlations were between service and learning ($r = .635$), learning and satisfaction ($r = .630$), and service and satisfaction ($r = .618$), emphasizing the impact of staff responsiveness and educational value on overall experience. Facilities also correlated with learning ($r = .604$) and satisfaction ($r = .515$), while accessibility showed moderate links (learning: $r = .503$; satisfaction: $r = .524$). Souvenirs had the weakest but still meaningful correlation with satisfaction ($r = .384$). Satisfaction was positively linked to revisit intention ($r = .472$). Learning also showed the strongest connection to revisit intention ($r = .535$), reinforcing education's role in visitor loyalty. These relationships illustrate the behavioral dimension of tourist perceptions, where positive experiential evaluations translate into future-oriented actions such as revisit intention and pro-environmental behavior. Enhancing educational activities and expanding souvenir options such as site-specific, eco-themed products could improve satisfaction and economic outcomes.

5. DISCUSSION

This study examined tourist preferences for thematic models of ecology, culture and art, and wellness at Suan Pa Ket Nom Klao. Framed through the integrated conceptual framework, these findings provide a holistic understanding of how cognitive, affective, and behavioral perceptions are formed within a community forest context.

5.1 Social equity and cultural co-construction

Culture and art activities also performed well, particularly among international tourists, emphasizing the growing demand for authentic, immersive cultural experiences (du Cros & Salazar, 2012; Genc & Gulertekin

Genc, 2023). These results support the integrated theoretical framework's capacity to accommodate diverse visitor profiles through multidimensional experience design. Cultural background significantly influenced perceptions—most notably in the bee demonstration, which Asian tourists rated as artistic and Western tourists rated as ecological. This reflects broader cultural orientations: collectivist tourists (e.g., from East and Southeast Asia) often emphasize creativity and group interaction, while Western visitors prioritize nature education. Such variations highlight how tourist perceptions in community forests are co-constructed through socio-cultural context and interaction with locally embedded activities. This variation has direct implications for targeted service design. For instance, integrating folklore or storytelling elements could significantly boost appeal for Asian markets, while providing detailed ecological data might better engage Western audiences, potentially improving group satisfaction.

5.2 Ecological challenges in peri-urban contexts

Tourists exhibited a distinct, statistically significant preference for the wellness and culture and art models over passive ecological engagement. Mean scores for the thematic models showed that the ecology model ($M = 3.93, SD = 1.04$) received notably lower ratings compared to the wellness model ($M = 4.17, SD = 0.93$) and the culture and art model ($M = 4.16, SD = 1.07$). This represents an approximately 5–6% lower perception score for ecology-related activities (mean differences of 0.24 and 0.23 respectively), with one-way ANOVA confirming statistical significance ($p = .003$ and $p = .005$). This 5–6% perception gap highlights a core challenge for biodiversity-limited peri-urban community forests such as Suan Pa Ket Nom Klao. From a cognitive perspective, passive ecological activities (e.g., the forest walk) were less effectively interpreted as meaningful or distinctive experiences by visitors. This finding underscores the necessity for strategic service design enhancements. For instance, transforming the forest walk into a more interactive experience such as incorporating guided “forest bathing” tours (Rodtook et al., 2024), could potentially elevate emotional engagement and satisfaction. While the exact magnitude of improvement would require further testing, similar interpretive and guided nature-based interventions in comparable settings have typically yielded 5–10% gains in visitor satisfaction and perceived value.

5.3 Economic viability and service-led livelihoods

The wellness model such as herbal oil making and foot spa massages, demonstrated strong universal appeal, with no significant variation across tourist types. This finding is particularly relevant in the context of the strong post-pandemic recovery of wellness tourism. The Global Wellness Institute (n.d.) reported that global wellness tourism expenditures grew by 36% annually from 2020 to 2022 and projected the sector to grow by 16.6% annually from 2022 to 2027, reaching approximately US\$1.4 trillion by 2027. This growing market suggests opportunities for Suan Pa Ket Nom Klao to develop low-impact, locally grounded wellness offerings that integrate community knowledge and services while supporting local livelihoods.

5.4 Integrated framework synthesis

The integration of UX, the Tourist Experience Model, and the TBL framework provides a holistic explanation for these outcomes. UX interactions with designed elements served as the primary catalyst, shaping perceptions of ‘Wellness’ and ‘Learning’. These enhanced perceptions are the drivers of TBL sustainability, securing the economic pillar through high revisit intentions while fostering environmental stewardship. Ultimately, these findings highlight the importance of aligning community forest service design with the interconnected goals of social equity, environmental stewardship, and economic viability.

5.5 Limitations and future research

This study has several methodological limitations. Although the data provided valuable insights into visitor perceptions, the sampling and data collection framework was not originally designed to support a fully integrated analysis across all visitor segments and experiential dimensions. As a result, some findings reflect the perspectives of specific visitor groups rather than a unified assessment of the entire visitor population. This limitation may have reduced the coherence of cross-segment comparisons and constrained the generalizability of the proposed service design framework.

Future research should adopt a more integrated research design from the outset, using synchronized sampling and data collection procedures to ensure that all participant groups are evaluated under a common analytical framework. A stratified sampling approach combined with standardized measurement instruments would facilitate more robust comparisons across visitor segments and thematic experiences. Such an approach would also enable the application of advanced analytical techniques, such as structural equation modeling (SEM), to examine the relationships among experiential dimensions, visitor satisfaction, and behavioral intentions within a unified framework.

6. CONCLUSION

This study demonstrates that Suan Pa Ket Nom Klao's viability as a sustainable community forest destination depends on the strategic application of an integrated framework encompassing ecology, culture and art, and wellness. Our analysis confirms that thematic interpretation is a distinct, multidimensional construct that directly shapes tourist perceptions of satisfaction and revisit intention. The findings reveal a significant 5–6% preference gap favoring wellness and culture and art over ecological engagement. This suggests that passive ecological observation must be transformed through active, interpretive service design. Because learning and service quality emerged as the primary drivers of perception, educational and service-based interventions may improve overall visitor satisfaction.

Cultural background plays a significant role in influencing visitor perceptions. This is particularly evident in the diverse interpretations of the bee demonstration. This underscores the importance of culturally tailored experiences to enhance engagement. While souvenirs and accessibility were secondary factors, their improvement can further enrich the overall visitor experience. Addressing the relatively lower appeal of ecology-based activities is essential for achieving a more balanced and holistic tourism offering.

To position Suan Pa Ket Nom Klao as a model for community-based tourism, stakeholders should adopt a coordinated and strategic approach. Community forest managers, in partnership with village health volunteers, are encouraged to implement a six-month pilot program featuring guided ecological tours, such as forest bathing. This initiative aims to promote inclusive and accessible green spaces that support physical and mental well-being across diverse visitor groups. Simultaneously, local artisans, with support from CSR partners, should conduct a three-month workshop focused on developing eco-friendly souvenirs, with the objective of increasing local income. Tourism activities should be culturally responsive, for example by incorporating Thai folklore into bee demonstration sessions to enhance engagement and foster inclusive tourism that supports local economic development. To ensure the feasibility and scalability of these initiatives, the Samut Prakan provincial government is urged to allocate seed funding. Policymakers should also streamline regulatory procedures to support the development of low-impact infrastructure, such as eco-friendly walkways, ensuring alignment between conservation priorities and tourism objectives.

In parallel, researchers should pursue multi-site comparative studies across peri-urban and rural community forests, along with longitudinal assessments, to evaluate the long-term effectiveness of these interventions and inform best practices in sustainable tourism at both national and international levels.

DECLARATION

1. Conflict of interest

The authors declare that they have no known competing personal relationships that could have appeared to influence the work reported in this paper.

2. Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT (OpenAI) to assist with developing the manuscript outline and improving English grammar, phrasing, and readability. The AI tool was used solely to support the writing process and did not contribute to the study design, data collection, data analysis, interpretation of results, or generation of figures. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of this publication.

3. Data availability statement

The data supporting the findings of this study are openly available in Zenodo at <https://doi.org/10.5281/zenodo.20733957>. The dataset includes the research data used for the analyses reported in this article.

4. Ethics statement

Ethical approval was obtained from the Institutional Review Board at King Mongkut's University of Technology Thonburi (Approval number: KMUTT-IRB-2024-0820-253).

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6. Contributor Role Taxonomy (CRediT)

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