Towards Sustainable Rural Tourism: An SEM Study of Tourist Satisfaction in Thai Nguyen's Tea Craft Villages

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ABSTRACT

This study was carried out to identify factors affecting tourist satisfaction in tea craft villages in Thai Nguyen province, Vietnam. The authors made use of the structural equation modeling (SEM) method. The primary data was collected from a survey of 320 tourists, focusing on five latent factors: service quality, experience quality, destination image, perceived value and authenticity. The CFA analysis results showed that the scales all ensured reliability and convergent validity (CR > 0.7; AVE > 0.5; HTMT < 0.85). The structural model had a good fit (χ^2/df = 1.515; CFI = 0.976; TLI = 0.972; RMSEA = 0.040). The SEM results indicate that service quality (β = 0.295), destination image (β = 0.271) and experience quality (β = 0.249) are the factors that have the strongest impact on satisfaction; while authenticity (β = 0.180) and perceived value (β = 0.136) also have a statistically significant influence. The model explains 54.5% of the variation in tourist satisfaction. This finding emphasizes the role of improving service quality, creating real experiences and building a positive destination image to enhance satisfaction. The study contributes to additional empirical evidence for craft village tourism and provides management and policy implications for the sustainable development of tourism in tea craft villages in Vietnam.

1. INTRODUCTION

In the context of developing rural tourism and experiential tourism in Vietnam, traditional craft villages play an important role in preserving cultural values, creating livelihoods for the community, and contributing to diversifying tourism products [1-3]. Thai Nguyen is known as the "tea center" of the country, with dozens of craft villages growing, processing and trading in tea. Thai Nguyen tea products have built a strong brand in the domestic and foreign markets, considered a symbol of Vietnamese tea culture [4].

However, in reality, the number of tourists visiting Thai Nguyen tea villages is still limited compared to its potential. Although tea is a well-known specialty, the number of tourists choosing to experience tea villages is not high; in particular, the rate of visitors returning for a second or multiple times remains low. Some studies show that factors such as infrastructure quality, services and community participation have an important impact on the development of craft village tourism, but in Thai Nguyen, there are still many limitations in building experiential services [5, 6].

Specifically, tea villages in Thai Nguyen currently still tend to the traditional production model: planting, harvesting, drying tea and packaging. Tourists mainly come to buy products, take a few pictures at the tea hills, and then quickly leave. Meanwhile, tea cultural experience services such as tea tasting ceremonies, visiting the processing process, participating in product packaging, or ancillary services such as cuisine, accommodation, and souvenirs have not been properly invested [1, 5]. The lack of rich experiential activities and synchronous support services reduces the attractiveness of the destination, thereby directly affecting the satisfaction level and intention to return of tourists [4, 7].

From a research perspective, this raises the question: What factors determine the satisfaction of tourists in Thai Nguyen tea craft villages? Answering this question not only helps explain the reasons for the limited number of visitors and low return rate, but also provides a practical basis for orienting policies and solutions to develop tea craft village tourism in a sustainable direction. Recent studies on rural tourism and craft village tourism often focus on a number of aspects such as authenticity, destination image, service quality, experience quality and perceived value [1, 3, 5]. However, few studies apply structural equation modeling (SEM) to simultaneously analyze these factors in the specific context of tea craft villages, which both have agricultural economic value and are unique cultural and tourism spaces.

The selection of the topic "Determinants of Tourist Satisfaction in Tea Craft Villages: An SEM Approach from Thai Nguyen, Vietnam" comes from two main reasons. First,

in terms of practice, the study aims to accurately reflect the current situation of Thai Nguyen tea craft villages, pointing out gaps in tourism product development and key factors affecting customer satisfaction. The research results will help localities, tourism businesses and craft village communities have a scientific basis to redesign products, diversify activities, and improve service quality, thereby attracting more tourists and increasing the return rate. Second, academically, the study adds empirical evidence to the theory of tourist satisfaction in the context of rural tourism in developing countries, where the relationship between authenticity, experience, destination image, perceived value, service quality and satisfaction has not been fully tested [3-5].

2. MATERIAL AND METHODS

2.1 Research gap and objectives

2.1.1 Research gap
Although there have been many international studies examining tourist satisfaction in the contexts of heritage tourism, cultural tourism, and rural tourism, most of them have focused on famous destinations or relatively well-developed service models [7, 8]. These studies often refer to factors such as authenticity, service quality, destination image, perceived value, and experience quality. However, there are still some notable gaps.

First, research applying structural equation modeling (SEM) in the context of craft village tourism is very limited, especially in developing countries [9].

Second, in Vietnam, although there are studies on community tourism, ecotourism, and stakeholders' tea value chain, Thai Nguyen tea villages have been almost unexplored in international academic works [1, 5, 10].

Third, satisfaction scales have mainly been tested in popular contexts such as urban, heritage or beach tourism. Re-testing in the context of tea villages is necessary to expand the generalization value of the theory [11-14].

2.1.2 Research objectives
Based on the above gaps, the study aims at the following objectives:

1. Identify and test factors affecting tourist satisfaction in Thai Nguyen tea craft villages.

2. Measure the impact of factors (authenticity, experience quality, destination image, service quality and perceived value) on satisfaction.

3. Identify the most important factors determining satisfaction, thereby proposing management implications to improve tourist experience and increase return rates.

2.1.3 Research questions
To achieve the objectives, the study raises four main questions:

1. What factors affect tourist satisfaction in Thai Nguyen tea craft villages?

2. How does the impact of each factor (authenticity, experience quality, destination image, service quality, perceived value) on satisfaction differ?

3. Which factors play the most decisive role in tourist satisfaction?

4. What managerial implications do the research results suggest to enhance the experience, improve service quality and attract repeat visitors?

2.2 Literature review

In tourism research, tourist satisfaction is considered a core factor determining the competitiveness and sustainable development of a destination. Many recent works show that satisfaction depends not only on tangible factors such as services or facilities, but also on authentic experiences, destination image and perceived value [12, 13]. However, the context of craft village tourism, especially the Thai Nguyen tea craft village, has not been systematically tested by advanced quantitative models such as SEM. This section will review six main factors: five independent factors (authenticity, experience quality, destination image, service quality, perceived value) and one dependent factor (tourist satisfaction).

2.2.1 Authenticity
Authenticity reflects the perceived genuineness of a destination, encompassing both object-based (landscape, artifacts) and existential (personal engagement) dimensions [14]. In this study, authenticity is measured via four items (AU1–AU4) that capture the essence of Thai Nguyen tea villages: the local cultural space, traditional tea processing methods, authentic stories shared by artisans, and the destination's true identity.

2.2.2 Experience quality
Experience quality is the overall assessment of visitors about the tour activities. It was stated that experience quality includes learning, enjoyment, escape, and direct participation [14]. When visitors have the opportunity to participate in activities such as tea picking, tea drying, and tea tasting, the quality of the experience will be higher, contributing to increased satisfaction.

2.2.3 Destination image
Destination image is a set of perceptions, beliefs, and emotions that visitors associate with a place [3]. A positive destination image not only helps raise expectations but also increases actual satisfaction [2]. For tea villages, the image of green tea hills, tea culture space, and relaxing atmosphere play an important role in forming a positive impression.

2.2.4 Service quality
Service quality is a variable that is often proven to have a strong influence on tourist satisfaction. It was pointed out that safe services, adequate facilities, staff friendliness, and clear information improve satisfaction and loyalty [9]. However, in a study of traditional craft villages in Vietnam, ancillary services (food, accommodation, and guides) were emphasized to be limited, affecting the visitor experience [1].

2.2.5 Perceived value
Perceived value reflects the balance between the benefits and costs of a tourism experience. When visitors feel that the experience brings more value than the cost, the level of satisfaction increases and the likelihood of returning is also greater [3]. This is especially important in rural tourism, where visitors often expect cultural experiences associated with reasonable costs.

2.2.6 Tourist satisfaction
Tourist satisfaction is defined as the comparison between pre-trip expectations and actual experiences [4]. Recent studies have shown that satisfaction is simultaneously

influenced by many factors: authenticity, experience, destination image, service quality and perceived value [3, 9, 12]. In the context of the Thai Nguyen tea village, re-examining this model will bring new evidence, with theoretical and practical value. In summary, international studies have confirmed that authenticity, experience quality, destination image, service quality and perceived value all have a positive impact on tourist satisfaction. However, the context of Thai Nguyen tea village tourism has not been fully exploited, creating an important research gap. This study will inherit the previous theoretical basis and apply SEM to analyze the relationships.

2.3 Conceptual framework and hypotheses development

Based on the theoretical foundation and previous research review, five independent factors–authenticity, experience quality, destination image, service quality, and perceived value–are expected to have a positive impact on tourist satisfaction. Previous studies have demonstrated this relationship in the context of cultural, heritage, and rural tourism [9, 12-14]. However, no study has yet verified this model in the context of tea villages in Vietnam, which have both agricultural economic value and a unique cultural-tourism space.
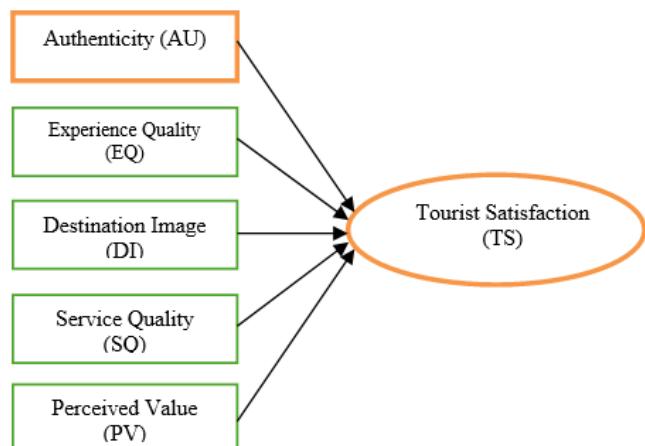
Figure 1. Proposed research model
Source: Proposed by the authors.

Based on Figure 1, we have developed hypotheses:
H1: Authenticity has a positive effect on tourist satisfaction in tea craft villages.
H2: Experience quality has a positive effect on tourist satisfaction in tea craft villages.
H3: Destination image has a positive effect on tourist satisfaction in tea craft villages.
H4: Service quality has a positive effect on tourist satisfaction in tea craft villages.
H5: Perceived value has a positive effect on tourist satisfaction in tea craft villages.

2.4 Research methodology

2.4.1 Research design
The study used a quantitative, cross-sectional design with a structured questionnaire survey for tourists aged 18 and over who had experienced at least one activity in tea villages in Thai Nguyen. Convenience sampling was controlled (quota by destination/time frame and source of visitors: local, inter-

regional, international). A total of 320 valid tables were collected for analysis. Regarding the sample size for SEM, the model has 23 observed variables (SQ1–SQ4, EQ1–EQ4, AU1–AU4, PV1–PV4, DI1–DI4, TS1–TS3) with a ratio of $\approx$ 13.9 observations/variable, meeting the recommendation of $\geq$ 200 and $\geq$ 10–15 observations/variable for CFA/SEM [15].

The questionnaire consists of three parts: (i) demographics and travel behavior; (ii) measurement scale of latent constructs (authenticity, experience quality, service quality, perceived value, destination image, tourist satisfaction) on a 5-point Likert scale; (iii) quality control questions. The scale was built from previous documents, back translated, peer reviewed and pilot tested for semantic correction.

Analysis process: (1) data cleaning (missing, outliers, distributional premises); (2) reliability assessment (Cronbach's alpha) and measurement value: CR $\geq$ 0.70, AVE $\geq$ 0.50, discriminant value according to Fornell–Larcker; (3) CFA to test the measurement model, reporting χ^2/df, CFI, TLI/NFI, IFI, RMSEA according to common thresholds; (4) SEM structural model estimation and hypothesis testing, indirect effects tested by bootstrap.

2.4.2 Sample and data collection
The respondents were tourists aged 18 years old who had experienced at least one sightseeing/shopping activity at the tea villages in Thai Nguyen. Controlled convenience sampling was conducted by on-site interviews; participants were voluntary and anonymous. The instrument process included translation-back translation, expert review and preliminary testing before the official survey. After quality screening (removing abnormally fast responses, missing large data and sample responses), 320 valid tables were collected for analysis. This sample size exceeds the commonly recommended threshold for medium-level SEM models (minimum of about 150–200 observations), helping to increase the estimation stability and test strength.

To reduce common method bias (CMV), the study applied procedural measures (confidentiality/anonymity prompts, no "true-false" answers, reversed item order) and post hoc testing: Harman's single-factor test/latent method factor and correlation testing between indicator variables.

Data were coded by demographic categories (gender, age group, education, income, residence) and 5-point Likert scales for latent constructs; cleaned and stored securely before conducting EFA, CFA and SEM.

2.4.3 Measurement instrument
The variables in the model are measured using a 5-level Likert scale (1 = Completely disagree to 5 = Completely agree). The scale was translated into Vietnamese, adjusted to the context of the Thai Nguyen tea village and preliminarily tested by a pilot survey (pilot test ~30 customers) to ensure clarity and reliability. Reference sources for building the scale based on previous studies (Table 1).

2.4.4. Data analysis methods
The data from 320 questionnaires were cleaned, coded and described using SPSS (missing rate, outliers according to z-score/Mahalanobis). Distributional assumptions were checked (skewness/kurtosis |skew|, |kurtosis| $\lesssim$ 2; Mardia). To reduce common method variance (CMV), procedural measures (anonymity, question order) and posteriori tests were applied: Harman's single-factor and the "unmeasured latent method factor/marker variable" model.

Table 1. Factors, number of items, and sources of measurement

Factor/Code	No of Items	Description	Sources of Measurement
Authenticity (AU)	4	Level of "realism" in the experience: space, processing, local culture	[12, 13]
Experience Quality (EQ)	4	Overall rating of enjoyment, learning value, and direct involvement	[13]
Destination Image (DI)	4	Tourists' impressions, perceptions and feelings about destinations, landscapes and local identities	[2, 3]
Service Quality (SQ)	4	Service quality: facilities, safety, staff, ancillary services	[1, 9]
Perceived Value (PV)	4	The balance between benefits received and costs (money, time, effort)	[14]
Tourist Satisfaction (TS)	3	Overall satisfaction, comparison between expectations and experience	[4, 5]

(Source: Compiled by the authors based on prior studies)

Next, the reliability of the scale was assessed: the observed variables with low item-total correlations were excluded; Cronbach's $\alpha \geq 0.70$. If EFA was used to explore the structure, Principal Axis Factoring with Promax was used; criteria: KMO ≥ 0.60, Bartlett's Test $p < 0.05$; keeping factors with eigenvalue > 1, factor loading ≥ 0.50 and cross-loading difference ≥ 0.30 [15].

The measurement model was tested by CFA in AMOS (ML). Reported fit: $\chi^2/df \leq 3$, CFI/TLI/IFI ≥ 0.90 (preferred ≥ 0.95), RMSEA ≤ 0.06–0.08, SRMR ≤ 0.08. Convergent validity and reliability: factor loading ≥ 0.50, CR ≥ 0.70, AVE ≥ 0.50. Discriminant validity: Fornell–Larcker ($\sqrt{AVE}$ greater than correlation coefficient) and HTMT < 0.85 [16].

3. RESULTS

3.1 Descriptive statistics of respondents

Based on n = 320 valid samples, the characteristics of the respondents show a fairly balanced sample structure and are suitable for SEM analysis, while suggesting some potential differences that need to be tested.

Table 2. Respondents' demographic profile (n = 320)

Variable	Frequency	Percent (%)
Gender		
Male	134	41.9
Female	186	58.1
Age		
Under 30 years old	85	26.6
From 30 to 45	133	41.6
Over 45	102	31.9
Residence		
In Thai Nguyen province	185	57.8
from other provinces	102	31,9
foreigner	33	10.3
Job		
State servant	42	13.1
Company employee	89	27.8
Student	72	22.5
Other	117	36.6
Education		
Below university	174	54.4
University holder	133	41.6
Master and above	13	4.1
Monthly income		
Less than 10 million VND	79	24.7
From 10 to 20	123	38.4
More than 20 million VND	118	36.9

Source: Compiled by the authors.

According to Table 2, in terms of gender, women account for 58.1% and men 41.9%. This structure suggests the possibility of gender differences in expectations/experiences in constructs such as experience quality, service quality and perceived value.

In terms of age, the 30–45 age group accounts for the largest proportion (41.6%), followed by over 45 (31.9%) and under 30 (26.6%). The age structure is biased towards the mature and middle-aged groups that often have higher expectations of authenticity and perceived value, but are also sensitive to service factors.

In terms of place of residence, guests from Thai Nguyen province account for 57.8%, guests from other provinces 31.9%, and international guests 10.3%.

In terms of occupation, the distribution is quite dispersed: business employees 27.8%, students 22.5%, civil servants 13.1%, and others 36.6%.

In terms of education level, the group below university level accounts for 54.4%, while university level 41.6% and postgraduate level 4.1%. This structure suggests that it is necessary to pay attention to the communication/interpretation language at the destination at an understandable level, while controlling for education when analyzing perceived value and destination image, as education is often related to cultural sensitivity.

In terms of income, the distribution is relatively balanced: <10 million (24.7%), 10–20 million (38.4%, middle group–possibly median), ≥ 20 million (36.9%). There is a basis to test the differential effect by income on perceived value and satisfaction.

3.2. Descriptive analysis of factors

Table 3. Descriptive statistics for tea craft village factors and tourist satisfaction

Factor	Mean (M)	Std. Deviation (SD)
Destination Image (DI)	3.47	0.70
Experience Quality (EQ)	3.50	0.79
Service Quality (SQ)	3.32	0.78
Perceived Value (PV)	3.52	0.71
Authenticity (AU)	3.53	0.74
Tourist Satisfaction (TS)	3.55	0.61

Source: Compiled by the authors

Table 3 shows that the average (Mean) of the factors in the study ranges from 3.32 to 3.55 on a 5-point Likert scale. The factor with the highest average value is TS = 3.55, reflecting that, in general, tourists are quite satisfied when participating in tourism in Thai Nguyen tea villages. Other factors, such as AU = 3.53 and PV = 3.52, also reached relatively high levels, showing that tourists positively evaluate the authenticity and

value received. Meanwhile, SQ = 3.32 has the lowest score, reflecting the limitations in service at the destination, which may be an issue that needs priority improvement.

In terms of dispersion, most factors have standard deviations (SD) from 0.61 to 0.79, demonstrating that the level of consensus among tourists is at an average level, not too dispersed. Notably, TS has the lowest SD (0.61), indicating high consistency in tourists' satisfaction assessments. In contrast, EQ = 0.79 and SQ = 0.78 have larger standard deviations, reflecting differences in perceived experiences and services.

In summary, the descriptive results show that Thai Nguyen tea village tourism is quite positively evaluated by tourists, especially in terms of satisfaction, authenticity and perceived value. However, service quality is still limited and there are significant differences between tourist groups, which is an important suggestion for the management and development of village tourism products in the future.

3.3 Reliability analysis

The results of reliability analysis using Cronbach's Alpha presented in Table 4 show that all scales have values above 0.8, exceeding the acceptable threshold of 0.7. This proves that the scales used in the study have high reliability and ensure internal consistency between observed variables.

Table 4. Cronbach's Alpha for factors

Factors	No. of Items	Cronbach's Alpha (α)
Destination Image (DI)	4	0.843
Experience Quality (EQ)	4	0.87
Service Quality (SQ)	4	0.891
Perceived Value (PV)	4	0.854
Authenticity (AU)	4	0.874
Tourist Satisfaction (TS)	3	0.951

Source: Compiled by the authors

Specifically, SQ has a Cronbach's Alpha coefficient = 0.891 and EQ = 0.87, reflecting high stability in measuring service quality and tourism experience. Similarly, the factors DI = 0.843, PV = 0.854 and AU = 0.874 also show a solid level of reliability, ensuring that statements measuring these concepts are consistently evaluated by tourists.

Notably, TS has Cronbach's Alpha = 0.951, the highest among the scales, although it only includes 3 observed variables. This shows a very high consensus of tourists in assessing the level of satisfaction when participating in tea village tourism in Thai Nguyen. This result also confirms that tourist satisfaction is a stable and less variable measured construct.

In summary, all scales ensure high reliability, allowing the study to continue to use them in the next analysis steps such as EFA, CFA and SEM to test the research model.

3.4 Exploratory Factor Analysis (EFA)

The EFA analysis results in Table 5 show that the KMO coefficient = 0.871, exceeding the threshold of 0.8, proving that the data is suitable for factor analysis. The Bartlett test has a Chi-square value = 4721.862 with p < 0.001, confirming that the difference correlation matrix is statistically significant. Six factors were extracted with eigenvalue > 1, consistent with the proposed research model. The total explained variance reached 74.948%, exceeding the standard of 50%, showing

that the six factors explained most of the variation in the data. Thus, the EFA results confirmed the initial validity of the scale and created a solid foundation for the next CFA step.

Table 5. Results of Exploratory Factor Analysis (EFA)

Indicator	Value
Kaiser-Meyer-Olkin - KMO Measure of Sampling	.871
	4721.862 (df = 253, p < 0.001
Number of Components (Eigenvalue > 1)	6
Cumulative Variance Explained	74.948

Source: Compiled by the authors

3.5 Confirmatory Factor Analysis (CFA)

The results of the model fit test (Model Fit) show that all indices meet the recommended level, confirming that the measurement model has a good fit with the survey data. Specifically, the Chi-square/df index (CMIN/DF) = 1.485 < 3, reflecting an acceptable level of fit. The comparison indices such as NFI = 0.934; IFI = 0.977; TLI = 0.973; CFI = 0.977, all exceed the threshold of 0.9, showing that the model has a high level of explanation and compatibility with the observed data. In addition, the calibration indices such as PNFI = 0.794 and PCFI = 0.831 are both acceptable, confirming the stability of the model. In particular, the RMSEA index = 0.039 < 0.05 with PCLOSE = 0.982 > 0.05 shows that the model has a very good fit, and there is no significant difference between the hypothetical model and the actual model. Thus, the entire fit index results allow to confirm that the measurement model is appropriate, ensuring the basis for continuing the steps of analyzing convergent value, discriminant value (CR, AVE, HTMT) and testing the SEM structural model.

Table 6. Summary of CFA results

Construct	Factor Loading	CR	AVE	Conclusion
DI	0.70 – 0.81	.844	.575	Reliable, valid
EQ	0.75 – 0.85	.873	.633	Reliable, valid
SQ	0.77 – 0.86	.892	.674	Reliable, valid
PV	0.71 – 0.80	.858	.603	Reliable, valid
AU	0.69 – 0.87	.876	.641	Reliable, valid
TS	0.89 – 0.98	.954	.873	Reliable, valid

Source: Compiled by the authors

The CFA results presented in Table 6 confirm that the scales in the study all achieved reliability and convergent validity. Specifically, all factors had CR > 0.7 and AVE > 0.5, exceeding the acceptable threshold according to international standards. This proves that the observed variables measure latent concepts well, ensuring internal consistency and explanatory power of the scale. In particular, TS achieved CR = 0.954 and AVE = 0.873, the highest among the factors, reflecting the outstanding stability and reliability of the satisfaction scale. Other factors such as service quality (0.892; 0.674) and experience quality (0.873; 0.633) also showed very good measurement ability. Even factors with lower values such as destination image (0.844; 0.575) and perceived value (0.858; 0.603) still meet the standards, confirming their validity. Thus, the entire measurement model in the study of tea village tourism in Thai Nguyen is confirmed to be reliable and valid, creating a solid foundation for the SEM analysis step to test the research hypotheses.

Finally, the study assessed common method variance (CMV) to ensure data quality. Harman's single-factor test results

indicated that the first factor accounted for 32.48% of the total variance, which is well below the recommended 50% threshold. Furthermore, a Common Latent Factor (CLF) analysis was conducted, showing negligible differences in standardized regression weights when comparing the baseline model with the CLF model. These findings confirm that CMV is not a significant concern in this research.

Table 7. HTMT ratios among constructs

| Construct	HTMT					
	DI	EQ	SQ	PV	AU	TS
DI						
EQ	0.269					
SQ	0.091	0.623				
PV	0.204	0.372	0.479			
AU	0.103	0.276	0.304	0.386		
TS	0.434	0.631	0.637	0.506	0.367	

Note: All HTMT values < 0.85, confirming discriminant validity.
Source: Compiled by the authors

The results of the discriminant value analysis using the HTMT index (Table 7) show that all coefficients are smaller than the threshold of 0.85. This confirms that the concepts in the model have clear differences and do not overlap in measurement. Specifically, the factor pairs with the highest HTMT values are EQ - TS = 0.631 and SQ - TS = 0.637, reflecting a close relationship but still ensuring discriminant value. The remaining pairs such as DI - SQ = 0.091 or DI - AU = 0.103 have quite low values, showing a strong distinction between these constructs. Thus, all scales in the study met the standards of discriminant validity, ensuring the validity of the measurement model and providing a solid basis for testing the SEM structural model in the next step.

3.6 Structural model and hypothesis testing

In this section, the study conducts structural equation modeling (SEM) to assess the relationship between factors and tourist satisfaction at tea villages in Thai Nguyen. SEM allows for the simultaneous consideration of both measurement models and structural models, thereby providing comprehensive evidence on the suitability of the research hypothesis. Hypotheses H1–H5 are tested based on estimated coefficients and statistical significance levels. The test results are illustrated through the SEM diagram below.
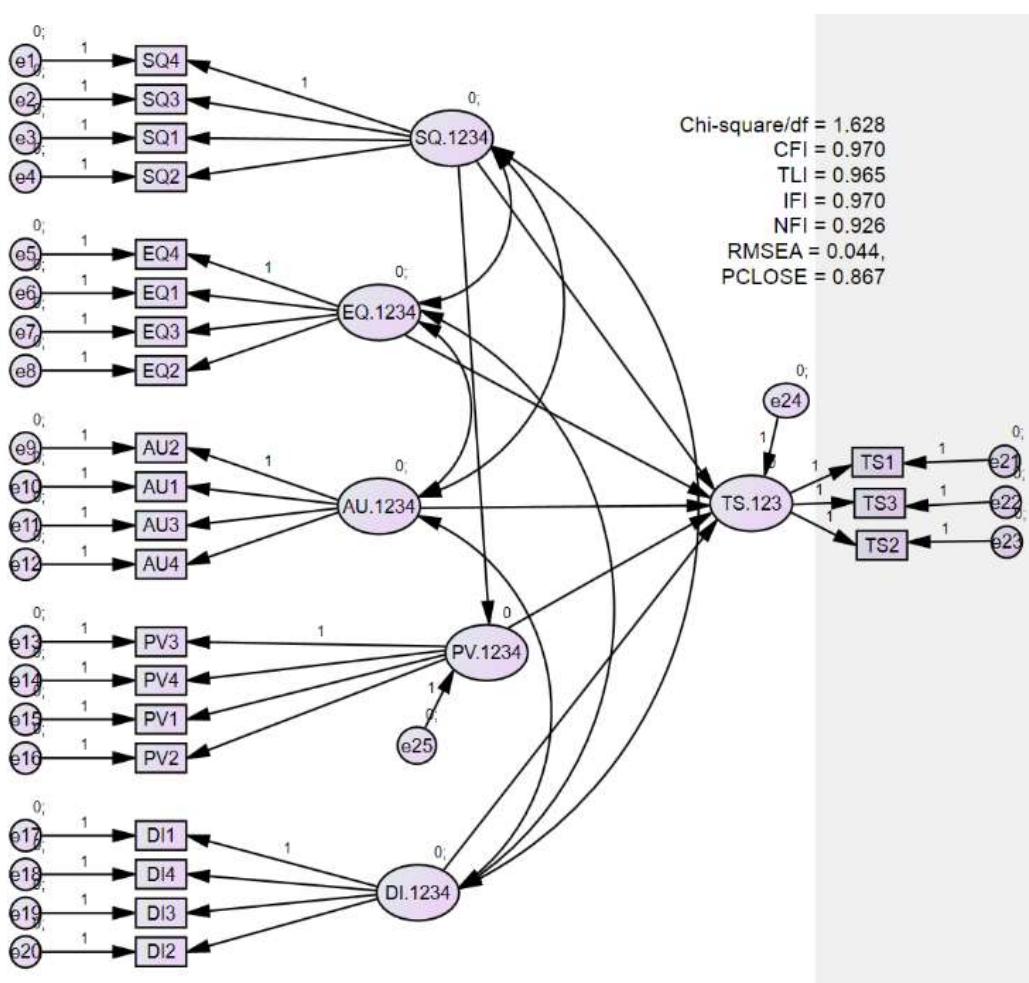
Figure 2. Structural equation model for tea craft village and tourist satisfaction
Source: Compiled by the authors

According to Figure 2, the model fit indices show that the SEM model achieves very good quality. The Chi-square/df index = 1.628 is less than 3, reflecting the acceptable fit of the model to the survey data. The comparison indexes such as CFI = 0.970; TLI = 0.965; IFI = 0.970; NFI = 0.926 all exceed the threshold of 0.9, confirming that the model is capable of reproducing experimental data at a high level. In particular, the RMSEA index = 0.044 (< 0.05) together with PCLOSE = 0.867 (> 0.05) show that the model is not only suitable but also optimal, that is, the difference between the hypothetical model

and the actual data is not statistically significant.

From a practical perspective, these results confirm that the research model on the relationship between factors such as service quality, experience quality, authenticity, perceived value and destination image on tourist satisfaction in Thai Nguyen tea craft villages is built in a reasonable and reliable way. This creates a solid foundation for analyzing hypotheses, thereby providing scientific evidence to help plan policies and strategies for developing craft village tourism in a sustainable direction and improving tourist experiences.

Table 8. Standardized regression weights, standard errors, critical ratios, and hypothesis testing

Hypo-Thesis	Path	Estimate (β)	S.E.	C.R.	P-value	Result
H1	DI → TS	.274	.040	5.725	***	Supported
H2	EQ → TS	.252	.041	4.433	***	Supported
H3	SQ → TS	.293	.046	4.803	***	Supported
H4	PV → TS	.149	.047	2.922	.003	Supported
H5	AU → TS	.182	.036	3.991	***	Supported
H6 (new)	SP → PV	.449	.052	7.141	***	Supported

Note: *** p < 0.001; The model explains 53.4% of the variance in tourist satisfaction (R² = 0.534)

Source: Compiled by the authors

The results of hypothesis testing presented in Table 8 show that all five hypotheses (H1–H5) were supported with high statistical significance (p < 0.05, with which the majority achieved p < 0.001). This proves that the factors in the research model all have positive and significant impacts on tourists' satisfaction when visiting tea craft villages in Thai Nguyen.

First of all, SQ has the highest standardized impact coefficient (β = 0.295, C.R. = 5.186, p < 0.001), showing that service quality is the most important factor determining satisfaction. This is consistent with the characteristics of craft village tourism, where tour guides, support and customer service play a key role in enhancing the experience.

Next, DI also showed a strong influence (β = 0.271, C.R. = 5.679, p < 0.001). This result confirmed that destination image – including the popularity, cultural identity and brand reputation of Thai Nguyen tea village – has a positive impact on tourists' feelings and satisfaction. When the destination image is communicated and built effectively, tourists' attachment and trust are strengthened. EQ has an impact coefficient of β = 0.249 (C.R. = 4.432, p < 0.001), reflecting that the quality of experience at the destination (participating in tea processing, learning about local culture, interacting with artisans, etc.) also plays an important role in creating satisfaction. This result is consistent with the trend of experiential tourism, where tourists value direct participation and the uniqueness of activities.

Meanwhile, AU also has a significant impact (β = 0.180, C.R. = 3.798, p < 0.001). The authenticity of production activities, cultural spaces, and the way people preserve traditions have contributed to improving customer satisfaction. This factor shows that tourists are not only looking for simple tourism products, but also want experiences associated with authentic cultural and historical values.

Finally, PV has an impact coefficient of β = 0.136 (C.R. = 2.519, p = 0.012), the lowest influence among the five factors, but still statistically significant. This implies that when comparing the costs and benefits, tourists still evaluate positively and are satisfied, although this factor is not the most decisive.

Notably, the model explains 54.5% of the variance in tourist satisfaction (R² = 0.545), an acceptable level in social studies, confirming that the factors selected in the study have high practical significance.

In summary, the results of hypothesis testing show that tourist satisfaction at Thai Nguyen tea village is simultaneously influenced by many factors, in which service quality, destination image and experience quality play a key role, while authenticity and perceived value play a supporting role. This suggests that managers and tourism businesses need to focus on improving service quality, while promoting cultural and traditional values, in order to increase satisfaction and attract tourists to return.

4. DISCUSSION

The SEM results show that tourist satisfaction at tea villages in Thai Nguyen is simultaneously influenced by five factors: service quality, destination image, experience quality, authenticity, and perceived value, of which the first three factors have a stronger impact. The model explains 54.5% of the variance in satisfaction (R² = 0.545), which is quite high in social research using SEM.

First, service quality (SQ) is the factor with the strongest impact on satisfaction (β = 0.295). This finding is consistent with many previous studies in the heritage and museum context, where service quality has been shown to be a determinant of satisfaction and loyalty [16, 17]. This implies that to improve satisfaction, craft village tourism destinations need to focus on improving basic service elements such as information, guidance, hygiene, safety and staff interaction.

Second, destination image (DI) also has a significant impact (β = 0.271). This result reinforces the role of destination image – especially emotional image – as an important antecedent of satisfaction [16]. In the context of the Thai Nguyen tea craft village, promoting the image of "tea land with living cultural heritage" can help increase overall satisfaction and destination brand positioning.

Third, experience quality (EQ) has a positive influence (β = 0.249), consistent with researches [18, 19], which emphasizes that unique and meaningful travel experiences are central to satisfaction and intention to revisit. Activities such as participating in tea processing, learning the tea ceremony, or chatting with artisans not only enhance emotional value but also strengthen tourists' attachment to the destination.

Fourth, authenticity (AU) also has a significant influence (β = 0.180). This result is consistent with the study [20], in which authenticity at cultural heritage tourism destinations helps enhance aesthetic experience and satisfaction. In the context of tea villages, preserving traditional production processes, maintaining tea ceremony rituals, and preserving craft stories are valuable resources to enhance tourists' sense of authenticity.

Finally, PV is the factor with the lowest impact (β = 0.136) but is still statistically significant. This finding is consistent with recent research on industrial heritage tourism destinations [7], which found that perceived value influences satisfaction, but the magnitude of the impact may depend on the context and expectations of visitors. In the case of tea villages, prices are often reasonable and domestic tourists place less importance on cost, making this variable have a more limited impact than service, experience or image.

Overall, the findings support theories on the quality-value-satisfaction relationship in heritage tourism [18], and extend

empirical evidence to craft village tourism – a segment that is less studied than cultural tourism or urban heritage tourism. These findings also imply that destination management needs to focus simultaneously on three aspects: improving service quality, enhancing real-life experiences, and building an attractive destination image.

5. CONCLUSIONS

This study tested the SEM model of tourist satisfaction with tea village tourism in Thai Nguyen with 320 observations. The results showed that five factors–service quality, destination image, experience quality, authenticity and perceived value– all had positive and statistically significant impacts on tourist satisfaction, in which service quality, destination image and experience quality were the strongest influencing factors. The model explained 54.5% of the variation in satisfaction (R^2 = 0.545), confirming its relevance and high application value in the practical context.

The study has contributed to expanding empirical evidence on craft village tourism – a field that is less studied than heritage and cultural tourism. The results emphasize the combined role of service quality, unique experiences, destination image and authenticity in enhancing satisfaction, thereby contributing to sustainable tourism development in the locality.

The findings of the study have several important academic implications:

First, the study reinforces the causal relationship among quality, value and satisfaction, which has been demonstrated in the context of heritage tourism [18, 19].

Second, the finding that destination image has an impact as strong as service quality suggests the unique role of agricultural-craft village destinations, as opposed to leisure tourism, where service is often dominant [16].

Third, the study adds evidence to the role of authenticity, in line with recent studies on heritage tourism [20], which emphasize that "living heritage" has a special value in enhancing experiences and satisfaction.

Finally, the results expand the application scope of SEM in the field of community and craft village tourism, contributing more empirical data from a province with a long-standing cultural tradition like Thai Nguyen.

Managerial Implications: From a practical perspective, the study offers some important management implications:

For businesses and tourist attractions:

Standardize service quality: Tour operators and tourist attractions need to develop a unified set of service standards (from reception, guidance, service, hygiene, to food safety). Regular training activities are needed for employees and collaborators to ensure stable service provision.

Innovate experiential products: Experiential service packages should be diversified, such as tea hill tours, handmade tea-making classes, tea tasting, and tea souvenir making. These products need to be designed into a closed-loop experience chain to increase visitors' length of stay and spending.

Apply digital technology: Promote online communication, ticket booking and payment via applications, provide digital guides, and smart maps to enhance convenience and increase perceived value.

For local authorities:

Building a destination brand: There needs to be a strategy to promote the image of "Thai Nguyen – Vietnam's Tea Capital" associated with local cultural identity. This can be implemented through international tea festivals, social media campaigns, and cooperation with the press and media agencies.

Tourism support infrastructure: Authorities should prioritize investment in roads to craft villages, bilingual sign systems, public restrooms, and parking lots to improve convenience and destination image.

Conservation and development policies: Issue a mechanism to support artisans and households participating in tourism activities; encourage community tourism models (homestay, farmstay) to both preserve culture and increase income.

For the community and artisans:

Preserving authenticity: People and artisans need to continue to maintain traditional processing procedures, organize ceremonies and tell stories about tea as part of the tourism product. This helps increase authenticity and differentiate from other destinations.

Improving tourism participation capacity: Communities need to be trained in communication skills, welcoming international guests, and tourism safety knowledge. The active and professional participation of the community is a decisive factor in the sustainability of the craft village tourism model.

Connecting local products: Encourage the development of additional tea-based ancillary products (cosmetics, creative drinks, tea-based cuisine) to diversify choices for tourists, increase perceived value and extend the consumption chain.

In summary, the above administrative and policy implications show that to improve satisfaction and sustainable development of tea village tourism, there needs to be synchronous coordination among businesses, government and community. When these three subjects act consistently, service quality, experience, destination image and authenticity will be strengthened, thereby increasing the perceived value and satisfaction of tourists, contributing to the sustainable development of tourism in Thai Nguyen province.

Limitations and Future Research:

Despite the positive results, the study still has some limitations. Firstly, the survey scope is limited to Thai Nguyen, not compared with other craft villages in the country. Secondly, the model does not consider the mediating role of emotions or behavioral intentions, which have been shown to be important in recent studies. Therefore, further studies should expand the survey space, add mediating and moderating variables (e.g., demographic characteristics, travel experience), and conduct inter-regional comparisons to have a more comprehensive. Thirdly, while the total sample size (n = 320) is sufficient for the aggregate model, the sample sizes of specific subgroups (e.g., Male: n = 134; Non-local tourists: n = 102) were not large enough to conduct a robust Multi-Group Analysis (MGA). Therefore, this study could not comprehensively compare differences between demographic segments. Future research should aim for larger, stratified samples to explore these potential moderating effects.

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