

AIMS Geosciences, 11(1): 7–26. DOI: 10.3934/geosci.2025002 Received: 27 September 2024 Revised: 01 December 2024 Accepted: 02 January 2025 Published: 10 January 2025

https://www.aimspress.com/journal/geosciences

# **Research** article

# Perceptions of cultural landscapes: Exploring tourist satisfaction in traditional villages

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**Abstract:** The cultural landscape of traditional villages is a valuable cultural heritage. Using the example of the Huangdu Dong Village, this study collected data on the perceptions of 209 tourists regarding the cultural landscape of traditional villages using a questionnaire survey. The perceptions and satisfaction rates of tourists were analyzed, and key factors influencing their satisfaction with the cultural landscape were identified. The results show that tourists generally hold a positive perception of traditional village cultural landscapes, with the highest levels of perceptions belonging to folk activity cultural landscapes and clothing cultural landscapes. Additionally, this study identified four key factors that have a significant positive impact on tourist satisfaction with the cultural landscape, namely architectural, water, vegetation, and service facility cultural landscapes. The research also found that tourists residing in rural areas reported significantly higher satisfaction with the cultural landscape than those living in urban areas; moreover, tourists with an income above 10,000 yuan exhibited significantly higher satisfaction compared to other income groups. Finally, based on its findings, this study provides recommendations for optimizing the protection, planning, and design of traditional village cultural landscapes to enhance overall tourist satisfaction.

Keywords: cultural landscape; traditional villages; tourist satisfaction; landscape perception

# 1. Introduction

Traditional villages are an integral part of the world's cultural heritage, preserving a wealth of tangible and intangible cultural landscapes that hold significant historical, cultural, aesthetic, and

tourism value for both individual nations and the international community [1-3]. In recent years, with the implementation of China's rural revitalization policies, tourism has increasingly become a key driver for the development of traditional villages [4-6]. This phenomenon can also be observed in other countries, such as Vietnam, Serbia, and Iran [7-10]. Tourism is widely regarded as an essential tool for cultural heritage preservation [11]. While it has successfully attracted large numbers of visitors to rural areas [12,13] and played a positive role in addressing industrial decline and promoting economic growth in traditional villages [14], its development often brings challenges [15,16], such as the homogenization of landscapes and the erosion of traditional culture [17,18]. These issues inevitably affect tourist satisfaction.

Tourist satisfaction is a critical factor in the competitiveness of tourism destinations [19,20]. Numerous studies have shown that cultural landscapes play a significant role in influencing tourists' perceived satisfaction [21,22]. Furthermore, by offering natural beauty and cultural elements, cultural landscapes contribute to improving public mental health and enhancing overall well-being [23,24]. However, existing research on satisfaction with cultural landscape perception has predominantly focused on preferences [25–27], with limited attention to the underlying influencing factors. Therefore, this study investigates the factors affecting tourists' perceptions of traditional village cultural landscapes, providing new theoretical insights for international cultural landscape research and the rural tourism sector. Additionally, these findings offer practical guidance for managers and planners of traditional villages in the protection and optimization of cultural landscapes, contributing to the sustainable development of cultural heritage in the context of modernization.

In 2012, the Ministry of Housing and Urban-Rural Development, the Ministry of Finance, and the Ministry of Culture of China jointly introduced both the concept and significance of traditional villages for the first time in the "Guiding Opinions on Strengthening the Protection and Development of Traditional Villages" document. According to this, a traditional village is defined as "a village formed in earlier periods, rich in cultural and natural resources, possessing historical, cultural, scientific, artistic, economic, and social value, and deserving of protection". Only villages that have undergone a national evaluation and have been included in the official list of Chinese Traditional Villages can be classified as traditional villages [28]. Between 2012 and 2024, after a rigorous selection process by Chinese government agencies, six batches of traditional village lists have been announced—this includes a total of 8,155 villages that are now under national protection (source: Traditional Village Network, www.chuantongcunluo.com).

Cultural landscapes represent a distinct form of heritage that encompasses both cultural and natural values [23]. Its concept was first introduced by German geographer Carl Sauer in 1925. He posited that cultural landscapes are shaped by human culture acting upon natural landscapes over time, and this interaction forms the cultural characteristics of a specific region [29]. In the 1994 "Operational Guidelines for the Implementation of the World Heritage Convention", cultural landscapes were defined as historical heritage sites with representative traditional aesthetics and cultural value [30]. Traditional villages, as products of long-term interactions between humans and nature, embody rich historical and cultural heritage and are considered exemplary cultural landscapes [31].

Current research on cultural landscape perception primarily analyzes the perception processes and characteristics from the perspectives of the public, experts, and tourists. For instance, Zhou et al. [27] used online tourist reviews to evaluate the cultural landscape perception of traditional villages in China and found that, overall, tourists had a positive perception of the cultural landscapes. However, the study also revealed a significant lack of public awareness regarding the cultural connotations of these

9

landscapes. Kang et al. [32] evaluated the perception of ecosystem cultural services within Nanchang's cultural landscapes from both expert and public perspectives, with results indicating that visual stimuli were the strongest, while tactile stimuli were the weakest. Shuib & Hashim [33] analyzed the cultural value of rural landscapes in northern Malaysia and southern Thailand from the perspectives of outsiders and tourists, discovering that these groups were more concerned with preserving landscapes that have recreational value, ecological and natural significance, historical heritage, and socio-cultural experiences. Santoro et al. [34] analyzed the impact of public participation on cultural landscape conservation in Cinque Terre and Porto Venere, Italy, from the perspective of landscape perception. The results showed that the involvement of local communities proved to be a highly effective tool for developing management plans. Additionally, some studies have explored various dimensions of landscape perception related to cultural landscapes. For example, Cheng et al. [35] discovered that architecture is a key reflection of the cultural value of traditional villages. The study by Shen, Aziz, Liu, et al. [17] found that the dimensions of cultural landscapes in traditional villages, including architecture, service facilities, and folk activity landscapes, significantly influence tourists' emotional attitudes.

Several studies have further validated the significance of cultural landscapes in tourism and analyzed their impact on tourist satisfaction. For example, Dragan et al. [36], from the perspectives of tourists and local officials, highlighted the critical role of watermill heritage landscapes in promoting regional tourism development. Similarly, studies by Mbaiwa & Siphambe [37] and Moscatelli [38] also emphasized the significant contribution of cultural heritage landscapes to tourism development. Furthermore, Shen et al. [22] demonstrated that the perceived quality of cultural landscapes significantly influences tourist satisfaction, which, in turn, enhances tourist loyalty through indirect effects. Additionally, Parta and Maharani [39] emphasized that cultural landscapes profoundly affect tourists' experiences and satisfaction, serving as a key driver for encouraging repeat visits.

In conclusion, although research on cultural landscape perception has made notable progress, studies on the factors influencing tourist satisfaction with cultural landscapes in traditional villages remain relatively limited. Such research is crucial for advancing the conservation of cultural heritage and promoting sustainable tourism development in traditional villages. By identifying the key factors influencing tourist satisfaction, findings can provide decision-makers with a scientific basis for optimizing cultural landscape management strategies, enhancing tourist satisfaction, and fostering the long-term value and sustainable utilization of cultural landscapes.

Accordingly, this study explores the impact of cultural landscape perception on tourist satisfaction from the perspective of visitors through a questionnaire survey, aiming to identify the cultural landscape indicators that most significantly influence tourist satisfaction. The findings not only offer practical insights for the management and optimization of cultural landscapes but also enhance tourist experiences and provide data to support future village preservation and cultural heritage transmission, contributing to the sustainable development of traditional villages in the context of modernization.

# 2. Materials and methods

# 2.1. Study case

Huaihua City, situated in the western section of Hunan Province, is known as the "Gateway to Guizhou and Yunnan" and serves as a cultural hub for multiple ethnic groups; it boasts a rich and diverse array of folk cultures. As of March 2023, a total of 187 villages in Huaihua have been listed in the National Directory of Traditional Villages, ranking first in Hunan Province and fourth nationwide. These traditional villages are densely distributed and characterized by distinctive regional features, diverse types of traditional architecture, and abundant intangible cultural heritage. They carry a profound historical and cultural legacy, making them highly valuable for academic research.

Based on this, Huangdu Dong Village was selected as the research site for this study. Located in Pingtan Township, Tongdao Dong Autonomous County, Huaihua City, Hunan Province (Figure 1), the village lies at the heart of the "Hundred-Mile Dong Village Corridor" in southwestern Tongdao and is characterized by distinct Dong cultural features. Established during the Ming Dynasty, Huangdu has a long history and a population of approximately 3,000 [40]. The village's overall landscape is well-preserved, featuring diverse cultural landscapes and traditional architecture. Public buildings exhibit rich folkloric characteristics, with clusters of traditional dwellings complemented by well-maintained structures such as wind-and-rain bridges, drum towers, sacrificial altars, ancient wells, old trees, and fengshui forests. Traditional folk activities, including the "He Long Banquet", Lusheng performances, and Dong songs, further highlight the village's unique cultural identity [22,40]. Additionally, Huangdu Dong Village is known as the "Hometown of Dong Brocade" and the "Hometown of Dong Opera". Figures 2 and 3 show an aerial view of the village and photographs of cultural landscape elements, respectively.

The village began tourism development in 1995 and was included in the third batch of China's Traditional Village Directory in 2015. It was designated as a national 4A-level tourist attraction in 2016 and selected as one of Hunan Province's first top ten characteristic cultural tourism towns in 2019 [40]. Today, it stands as a renowned traditional village tourism destination within Hunan Province [41].

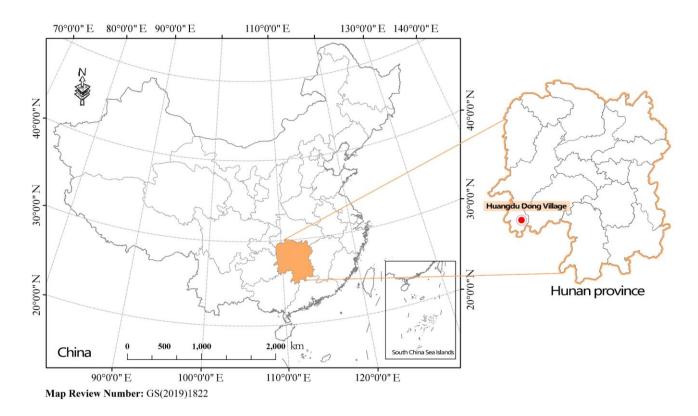


Figure 1. Map of the geographical location of Huangdu Dong Village.



Figure 2. Aerial view of Huangdu Dong Village (photos captured by the author).



Figure 3. Photos of Huangdu Dong Village (photos captured by the author).

# 2.2. Scale design

First, after reviewing the relevant literature covering the cultural landscape of traditional villages, this study divided the perception indicators of the traditional village cultural landscape into 11 aspects: architectural, spatial, water, vegetation, paved road, service facility, handicraft, clothing, folk activity, agricultural, and culinary culture [22,27,42]. The details of the cultural landscape indicators are presented in Table 1.

Dimension	Indicators	Indicator explanation				
	A1: Architectural cultural landscape	Architectural shape, type, decorative patterns, style, and				
		other features.				
	A2: Spatial cultural landscape	Site selection, layout, street space, etc., of the village.				
	A3: Water cultural landscape	Water activities, naming of water systems, legends and				
		stories, etc.				
	A4: Vegetation cultural landscape	More characteristic compared with plants in other places				
		plant legends, etc.				
	A5: Paved road cultural landscape	Antiquity of paving, presence of decorative patterns, etc				
Cultural	A6: Service facility cultural landscape	How well the facilities such as lamps, garbage cans, and				
		signage are coordinated with the village's environment.				
landscape	A7: Clothing cultural landscape	Whether the patterns, designs, and accessories of costume				
		follow Dong culture.				
	A8: Folk activity cultural landscape	The degree of excitement and characteristics of folklore				
		performance activities.				
	A9: Handicraft cultural landscape	The degree of beauty and characteristics of handicrafts				
		Dong brocade, cloth weaving, etc.				
	A10: Agricultural cultural landscape	The degree of awareness of the agricultural landscape, farming tools, crops, farming process, etc.				
	A11: Culinary cultural landscape	Whether the food has a characteristic identity.				
Satisfaction	Overall satisfaction with the cultural					
Sausiacuon	landscape.					

Table 1. Details of cultural	landscape indicators.
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Next, the survey questionnaire was designed, which consisted of two main sections: 1) Tourist demographic characteristics including gender, age, educational background, occupation, residence, and income; and 2) the main content of the questionnaire, focusing on the perception dimensions of cultural landscapes and overall tourist satisfaction, with a total of 12 items. Each item was measured using a 5-point Likert scale with proven reliability and validity [43] to more accurately assess tourists' perceptions of the cultural landscape and their overall satisfaction.

# 2.3. Determination of sample size

This study utilized G\*Power software to calculate the sample size. Renowned for its flexibility and extensive statistical testing capabilities, G\*Power is widely used in scientific research, particularly for determining sample size and evaluating statistical power. This study aims to identify influencing

factors through multiple linear regression analysis and to compare group differences using t-tests and one-way ANOVA. Sample size estimations were conducted separately for each statistical analysis required in this research.

For multiple linear regression, assuming an effect size  $f^2 = 0.15$  (medium effect), a significance level of  $\alpha = 0.05$ , a statistical power of  $1 - \beta = 0.80$ , and 11 predictors, the required sample size was calculated to be 123. For the t-test, with an effect size d = 0.5 (medium effect),  $\alpha = 0.05$ , and  $1 - \beta =$ 0.80, the required total sample size for two groups was 128. For the one-way ANOVA, assuming an effect size f = 0.25 (medium effect),  $\alpha = 0.05$ ,  $1 - \beta = 0.80$ , and six groups, the required sample size was 144. To ensure sufficient statistical power across all analyses, this study adopted the largest required sample size of 144 as the reference standard, ensuring that any sample size greater than 144 would meet the analytical requirements.

#### 2.4. Data collection and sample characteristics

From December 1 to December 5, 2024, this study conducted one-on-one questionnaire surveys with tourists in Huangdu Dong Village using random sampling. A total of 220 questionnaires were distributed; after excluding those with unclear answers or incomplete responses, 209 valid questionnaires were obtained, resulting in an effective response rate of 95.0%. Among the respondents, 40.2% were male, and 59.8% were female. Detailed demographic statistics of the tourists are shown in Table 2.

# 2.5. Analytical methods

This study employed SPSS 26.0 software for the quantitative analysis of the questionnaire data, including reliability and validity testing, descriptive analysis, multiple linear regression analysis, and group difference analysis. First, the reliability and validity of the questionnaire data were verified. Next, descriptive analysis was conducted to examine tourists' perceptions of the cultural landscape of traditional villages. Then, multiple linear regression analysis was used to identify key factors influencing tourist satisfaction with the cultural landscape. Finally, independent sample *t*-tests and ANOVA were applied to explore the differences between various demographic groups.

#### 3. Results

# 3.1. Analysis of tourists' perception and satisfaction with the cultural landscape of traditional villages

The calculation of scores for various cultural landscape indicators and overall satisfaction reveals that all cultural landscape indicators scored above 3.60, indicating that tourists generally hold a positive attitude toward the cultural landscape of traditional villages (Figure 4). Among these, indicators A7 (clothing cultural landscape) and A8 (folk activity cultural landscape) received the highest scores, both at 4.06, demonstrating strong recognition from tourists in these areas. Following closely behind was indicator A9 (handicraft cultural landscape), with a score of 4.00. The lowest score was for A3 (water cultural landscape), at 3.68. Although this is lower than the other cultural landscape indicators, it is still above the average value of 3.00, suggesting that tourists' overall perception of the water-based cultural landscape remained positive, still met tourists' expectations to a certain extent, and maintained

some degree of appeal. Its relatively weaker impact may be due to limited experience or recognition by tourists. Notably, the overall satisfaction score for the cultural landscape was 4.07, a high score that indicates a strong level of tourist satisfaction with the cultural landscapes of traditional villages.

Characteristics		Frequency	Percentage
Gender	Female	125	59.8%
	Male	84	40.2%
Age	<18	10	4.8%
	18–24	28	13.4%
	25–30	19	9.1%
	31–40	69	33.0%
	41–50	65	31.1%
	51–60	15	7.2%
	>60	3	1.4%
Education	Junior high school or below	38	18.2%
	High school	41	19.6%
	Junior college	69	33.0%
	Undergraduate	53	25.4%
	Postgraduate	8	3.8%
Occupation	Students	31	14.8%
	Enterprise workers	43	20.6%
	Government/institutional personnel	34	16.3%
	Retirees	9	4.3%
	Others	92	44.0%
Place of residence	Rural	95	45.5%
	Urban	114	54.5%
Average monthly disposable	<1000 RMB	31	14.8%
income	1001–3000 RMB	31	14.8%
	3001–5000 RMB	76	36.4%
	5001–8000 RMB	49	23.4%
	8001–10,000 RMB	3	1.4%
	> 10,001 RMB	19	9.1%

Table 2. Tourists' demographic statistics.

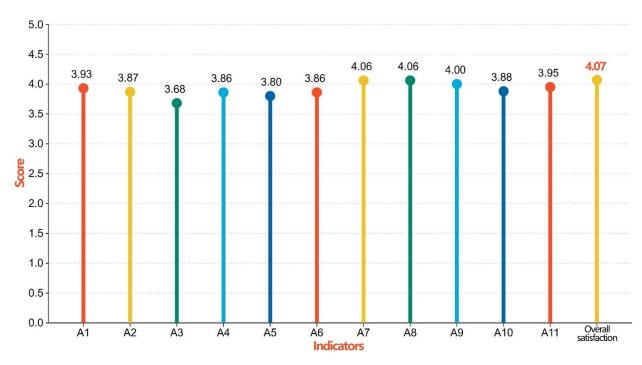


Figure 4. Tourists' perception of the cultural landscape and overall satisfaction scores.

3.2. Analysis results of factors influencing satisfaction with the cultural landscape of traditional villages

This study conducted a Pearson correlation analysis on all cultural landscape indicators and overall satisfaction. The results in Table 3 showcase that all cultural landscape indicators are significantly positively correlated with overall tourist satisfaction.

Indicators	Pearson's correlation coefficient	Sig.
A1: Architectural cultural landscape	.642**	0.000
A2: Spatial cultural landscape	.549**	0.000
A3: Water cultural landscape	.674**	0.000
A4: Vegetation cultural landscape	.688**	0.000
A5: Paved road cultural landscape	.582**	0.000
A6: Service facility cultural landscape	.580**	0.000
A7: Clothing cultural landscape	.552**	0.000
A8: Folk activity cultural landscape	.552**	0.000
A9: Handicraft cultural landscape	.643**	0.000
A10: Agricultural cultural landscape	.630**	0.000
A11: Culinary cultural landscape	.591**	0.000

Table 3.	Correlations.
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Note: \*\*. Significant correlation at the 0.01 level (two-tailed).

This study used SPSS 26.0 software to conduct a reliability test on the questionnaire items; the results of this test show a Cronbach's alpha value of 0.958, indicating a strong statistical correlation

between the items. Additionally, to evaluate the explanatory power of the linear regression model, a goodness-of-fit analysis was performed. The results in Table 4 show that the adjusted R<sup>2</sup> value of the model is 0.550, meaning that the model explains approximately 55.0% of the variance in the dependent variable. The Durbin-Watson value is 1.816; as it is close to 2, it indicates that there is no significant autocorrelation in the residuals (Table 5). Based on these results, it can be concluded that the model has a good fit.

This study performed multiple linear regression, forward regression, backward regression, and stepwise regression analyses on the data. By comparison, the results of the backward regression analysis were the most favorable, allowing four cultural landscape indicators to enter the model: architectural, water, vegetation, and service facility cultural landscapes (Table 6). This further demonstrates that these four cultural landscape indicators have a significant positive impact on overall tourist satisfaction.

R	$R^2$ Adj $R^2$ Standard error of		$R^2$ Adj $R^2$ Standard error of estimate		rbin-Watson
.748 <sup>h</sup>	0.559	0.550 0.4	187	1.8	316
		Table	<b>5.</b> ANOVA <sup>a</sup> .		
	Square sum	Degree of freedom	Mean square	F	Р
Regression	61.455	4	15.364	64.665	.000
Residuals	48.469	204	0.238		

Table 4. Model summary.

	Table 6. Backward regression coefficients.								
	Unstandardized coefficients		Standardized coefficients	t	Р	Collinearity statistics			
	β	Std. Error	Beta			Tolerance	VIF		
(Constant)	1.415	0.180		7.861	0.000				
A1	0.129	0.069	0.144	1.866	0.043	0.363	2.756		
A3	0.146	0.062	0.197	2.365	0.019	0.313	3.197		
A4	0.287	0.063	0.346	4.569	0.000	0.377	2.653		
A6	0.132	0.052	0.166	2.523	0.012	0.502	1.993		

208

109.923

#### 3.3. Analysis results of group differences in overall satisfaction based on demographic factors

This study analyzed the group differences in overall satisfaction using demographic variables such as gender, age, education background, occupation, residence, and income as grouping variables. Gender and residence, being binary variables, were analyzed using independent sample t-tests for group differences. Meanwhile, the other variables, being multi-categorical, were analyzed using oneway ANOVA. For variables with unequal variances, Welch's ANOVA was used. The statistically significant group differences are summarized and presented in Tables 7 and 8.

Table 7 presents the analysis results of the differences in overall satisfaction with the cultural landscape of traditional villages between tourists from different residences. The results indicate a

Total

significant difference between the two residence groups, with a *P*-value of 0.025, which is less than the 0.05 significance level. This suggests that tourists residing in rural areas have a significantly higher overall satisfaction level with the cultural landscape of traditional villages compared to tourists from urban areas.

Variable	Place of residence	Ν	Mean ± SD	t	Р
Satisfaction	Urban	114	$3.91\pm0.80$	2.261	0.025
	Rural	95	$4.14\pm0.63$		

Table 7. Group difference analysis of overall satisfaction based on tourists' residence.

Table 8 presents the analysis results of the differences in overall satisfaction with the cultural landscape of traditional villages among tourists with different income levels. The results reveal significant differences between tourists with different income levels, with a *P*-value of 0.003, lower than the 0.05 significance level. This indicates that tourists with an income above 10,000 yuan have significantly higher overall satisfaction with the cultural landscape of traditional villages compared to those with lower income levels.

Table 8. Group difference analysis of overall satisfaction based on tourists' income.

Variable	Average monthly disposable income	Ν	Mean ± SD	F	Р
Satisfaction	<1000 RMB	31	$3.94\pm0.69$	5.322	0.003
	1001–3000 RMB	31	$4.00\pm0.83$		
	3001–5000 RMB	76	$4.05\pm0.68$		
	5001–8000 RMB	49	$3.80\pm0.75$		
	8001–10,000 RMB	3	$3.83\pm0.76$		
	>10,001 RMB	19	$4.63\pm0.52$		

# 4. Discussion

# 4.1. Analysis of tourists' perception of traditional village cultural landscapes

By analyzing tourists' perceptions of the cultural landscapes of traditional villages, it was found that all cultural landscape indicators scored above 3.6, which indicates that tourists generally hold a positive attitude toward the cultural landscape of traditional villages. This aligns with previous studies, such as Zhang et al. [44] and Yang et al. [45], who found that these village cultural landscapes are highly attractive to the public. Additionally, in this study, folk activity and clothing cultural landscapes received the highest scores among all indicators. It is well-known that folk activities are the product of interactions made between villagers and their local environment, serving as symbols of local culture [46,47]. These activities reflect the unique cultural characteristics of the region and carry significant multicultural value [48]. Folk activity experiences are particularly popular with tourists [49]. Furthermore, Yang et al. [45] found that folk culture ranks highest among the cultural landscape indicators in traditional villages.

The high score for the clothingcultural landscape indicator can be largely attributed to the fact that the selected village is a traditional Dong ethnic village. Its clothing is not only vibrant in color

and adorned with intricate embroidery but also reflects unique regional characteristics, offering a strong visual appeal [50]. Other studies have also explored the tourism value of traditional clothing culture in China's ethnic tourism villages and highlighted that traditional clothing is not only a representation of labor and life experiences but also carries cultural meanings related to religion, aesthetic expression, and folklore. This cultural significance allows traditional clothing to play a key role in the tourism industry [51].

# 4.2. Analysis of the impact of cultural landscape perception on tourists' overall satisfaction

In the evaluation of traditional villages, tourists' overall satisfaction is influenced by a combination of multiple factors. This study conducted a multiple linear regression analysis by using the scores of various cultural landscape indicators as independent variables and the overall satisfaction score as the dependent variable. The results show that four cultural landscape indicators have a significant positive impact on tourists' overall satisfaction. These findings are consistent with others from existing literature, further cementing the important role that traditional village cultural landscapes play in shaping tourists' overall satisfaction.

There was a significant positive relationship between architectural cultural landscapes and overall tourist satisfaction ( $\beta = 0.129$ , P = 0.043). The architecture of traditional villages is not only a physical space but also a carrier of the region's culture and history, embodying the soul, aesthetics, and cultural charm of the area [52,53]. Additionally, the appearance, structure, design, and decoration of traditional buildings provide tourists with a unique visual experience while also reflecting the local customs and cultural essence to a certain extent [54]. This rich cultural experience can evoke an emotional resonance in tourists; this fosters a deep sense of identification with the region, thus enhancing their positive perception and overall satisfaction.

There was a significant positive relationship between water cultural landscapes and overall tourist satisfaction ( $\beta = 0.146$ , P = 0.019). Water bodies are highly important aesthetic elements in visual landscapes [55,56]; moreover, they have a positive impact on public preferences for visual landscapes [57]. In the study of specific cultural landscapes, water culture reflects the connection between humans and the natural environment, contributing to the unique cultural expression of villages. Shen et al. [58], in their research on the perception of traditional village landscapes, found that water landscapes are among the most favored visual elements for tourists. This preference is not only based on visual pleasure but also encompasses the interaction between water bodies and the geographical location, lifestyle, and cultural activities of traditional villages [59]. For example, traditional communities near coastal areas often develop a fishing culture [31,60]. Additionally, studies conducted by Jeon & Jo [61] and J. Zhao et al. [62] also emphasize that water landscapes not only provide visual satisfaction but also improve mental health and overall well-being. These multifaceted positive effects significantly enhance tourists' overall satisfaction, highlighting the importance of maintaining and enhancing water-based cultural landscapes in traditional villages.

There was a significant positive relationship between vegetation cultural landscapes and overall tourist satisfaction ( $\beta = 0.129$ , P = 0.000). Vegetation landscapes are an essential component of rural landscapes; not only do they help set the overall tone of a rural environment but also hold significant cultural value [63]. Sujarwo [64] noted that certain plant species in traditional villages carry cultural significance, emphasizing that traditional villages are exemplars of cultural and plant conservation. Zhuang & Du [65] highlighted that native plants carry rich regional cultural characteristics—an

example of this is the ancient camphor tree in Qingliu Laifang Village, which symbolizes the homes of the village's residents. These elements provide tourists with opportunities to gain a deeper understanding of local culture. The appreciation of such cultural expressions not only enhances the attractiveness of the site but also enriches the overall tourist experience and level of satisfaction. Z. Chen et al. [4] found that the diversity of vegetation in traditional villages has a significant positive impact on public aesthetic preferences. Polat & Akay [66] also pointed out that the seasonal variation in plant colors can enhance the public's visual experience.

There was a significant positive relationship between service facility landscapes and overall tourist satisfaction ( $\beta = 0.129$ , P = 0.012). First, meeting tourists' basic service facility needs has a significant and positive impact on their emotional attitudes [67,68]. High-quality and convenient service facilities can greatly enhance tourists' satisfaction and comfort levels [69,70]. Second, the construction of service facilities in traditional villages should integrate and reflect the local cultural characteristics. By meeting functional needs while conveying the unique charm of regional culture, service facilities can enhance the cultural experience of tourists, thereby improving overall satisfaction [71].

#### 4.3. Analysis of group differences in overall satisfaction based on demographic factors

By analyzing the group differences in overall satisfaction with the cultural landscape of traditional villages based on various demographic factors, this study found that tourists from rural areas reported significantly higher overall satisfaction than urban tourists. Q. Xu & Wang [31] noted that rural tourists and residents have a stronger sense of identification with the culture and landscape of traditional villages, and this sense of identification contributes to enhancing their perception and satisfaction with cultural landscapes [22,72]. Furthermore, this study found that high-income tourists—those with an income above 10,000 yuan—reported significantly higher overall satisfaction with the cultural landscape of traditional villages compared to lower-income tourists. High-income groups typically have greater spending power, which allows them easier access to high-quality tourism services [73,74]. Such services can improve tourist satisfaction and enhance their perception of cultural landscapes [22,75].

#### 5. Conclusions

#### 5.1. Conclusion and recommendations

This study, using Huangdu Dong Village as a case study, analyzed the impact of traditional village cultural landscapes on overall satisfaction from the perspective of tourist perception. The results indicate that 1) tourists generally have a positive perception of traditional village cultural landscapes; 2) architectural, water, vegetation, and service facility cultural landscapes have a significant positive impact on overall tourist satisfaction; 3) tourists residing in rural areas report significantly higher satisfaction with traditional village cultural landscapes than those living in urban areas; and 4) tourists with an income exceeding 10,000 yuan exhibit significantly higher satisfaction with traditional village cultural landscapes.

This study provides strong support for the planning and management of cultural landscapes in traditional Chinese villages and holds significant implications for rural tourism research. From a

theoretical perspective, it further validates the role of cultural landscapes as a core attraction in rural tourism and contributes to the understanding of the relationship between cultural landscapes and tourist satisfaction, particularly by examining specific elements such as architecture, water, and vegetation. This offers new insights into global rural tourism studies. From a practical perspective, the findings serve as a valuable reference for the management of cultural landscapes in rural tourism across other regions.

Based on the above research results, the following three recommendations are proposed for both optimizing and improving the planning and design of traditional village cultural landscapes to enhance overall tourist satisfaction:

(1) Enhancing the overall cultural landscape experience.

The results reveal that tourists have a generally positive perception of traditional village cultural landscapes, indicating that these landscapes possess a certain level of attractiveness. To further enhance the tourist experience, interactive cultural activities could be introduced, such as handicraft-making workshops and performances of traditional folk activities. These additions would allow tourists to not only observe but also participate and engage with the culture, thereby strengthening their cultural identity and satisfaction.

(2) Strengthening the protection of traditional village architectural, water, and vegetation cultural landscapes.

The results show that these three indicators have a significant positive impact on the overall satisfaction of tourists visiting traditional villages. Therefore, in the planning and design of cultural landscapes in traditional villages, efforts should be made to protect these elements and maintain their authenticity. This includes conducting planned restoration of historic buildings to preserve their original appearance, prioritizing the protection and maintenance of water systems to ensure ecological balance, and integrating waterside landscape facilities with the surrounding environment. Additionally, local plant species should be used to enhance the village's cultural vegetation atmosphere, while also minimizing the introduction of non-native species.

(3) Maintaining the regional characteristics of service facility landscapes while enhancing their convenience and comfort.

The results indicate that service facility landscapes have a significant positive impact on the overall satisfaction of tourists visiting traditional villages. Therefore, when designing service facility landscapes, it is important to maintain their harmony with the overall village landscape, avoiding excessive modernization that could disrupt the cultural atmosphere of the traditional village. At the same time, attention should be paid to the accessibility and convenience of service facilities during the planning process.

# 5.2. Limitation and future studies

This study identified the key cultural landscape factors influencing tourist satisfaction through quantitative analysis, providing a clear and interpretable model. However, the research has certain limitations. First, the single-case study design may limit the generalizability of the findings, making them less applicable to traditional villages with different cultural or geographical contexts. Future studies should include multiple traditional villages from diverse geographical locations and cultural backgrounds to enhance the generalizability of the results.

Second, as Gu and Ryan [76] noted, while quantitative methods provide valuable data, they often lack depth and contextual understanding, especially when analyzing culturally specific factors. To

address this limitation, future research could incorporate qualitative methods, such as in-depth interviews, focus groups, or field observations, to provide the contextual richness that quantitative approaches may miss. This integration would allow for a more comprehensive understanding of the relationship between cultural landscapes and tourist satisfaction.

Finally, this study employed a relatively broad classification of cultural landscapes, which may not fully capture the nuanced differences among categories. Future research should refine the categorization of cultural landscapes and conduct deeper analyses of each category to better reveal their specific impacts on tourist satisfaction.

#### **Author contributions**

Conceptualization: Huaheng Shen; Methodology: Huaheng Shen, Xueqin Tan; Formal analysis: Xiting Yu; Writing: original draft preparation: Huaheng Shen; Writing: review & editing: Huaheng Shen; Project administration: Huaheng Shen; Software: Xueqin Tan, Yu Luo; Visualization: Xueqin Tan, Xinmei Liu, Xiting Yu; Validation: Xinmei Liu; Investigation: Yu Luo, Xiting Yu.

#### Data availability

Data will be available on demand.

# Use of AI tools declaration

The authors declare they have not used Artificial Intelligence (AI) tools in the creation of this article.

#### **Conflict of interest**

The authors declare that they have no competing interests.

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