Research on the Relationship Between Total Quality Management and Sustainable Tourism Development – The Mediating Role of Tourism Benefits and Tourist-Perceived Quality

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Abstract

Total quality management (TQM) in the tourism industry has become a key factor in promoting sustainable tourism development. Applying TQM to the management of tourist destinations is conducive to achieving growth in the ecological, social, and environmental benefits. It enhances visitor satisfaction while fostering sustainable tourism development. Taking the 5A-level scenic spots in the Chengdu-Chongqing urban agglomeration as an example, this article uses data from 632 questionnaires and employs AMOS to construct the impact of total quality management on sustainable tourism development. The relationship between the two is verified using structural equation modeling (SEM). The results show that total quality management has a significant positive impact on sustainable tourism development, while tourism benefits and tourist-perceived quality act as mediators between total quality management and sustainable tourism development. Therefore, to promote sustainable tourism development, it is necessary to strengthen total quality management in all aspects of scenic destination management. This will provide tourism benefits, enhance visitor satisfaction with the scenic spots, and foster sustainable tourism development.

1. Introduction

With the continuous increase in people's incomes and the gradual rise in spiritual needs, tourism has become an important means of leisure and entertainment. In December 2021, the State Council of China

issued the "Notice on the Issuance of the 14th Five-Year Plan for Tourism Development," which explicitly emphasized the importance of promoting sustainable tourism development. In 2023, the Sichuan Provincial Government and the Chongqing Municipal Development and Reform Commission jointly issued the "Construction Plan for the Bashu Cultural Tourism Corridor." The plan emphasized that improving management efficiency and resource utilization rates should enhance sustainable tourism development and the sustainable use of tourism resources. Moreover, Chengdu-Chongqing has already become a major tourism region in China. In 2023, 9.3% of the GDP of the Chengdu-Chongqing urban agglomeration was contributed by the tourism industry, highlighting the significant value of promoting sustainable tourism development for the sustainable growth of the regional economy.

The fundamental task of total quality management in the tourism industry is to meet the needs of tourists and provide high-quality tourism products and services (Abbas et al., 2020). Through quality management of tourism products and services, tourists' satisfaction and experiences can be enhanced, which is crucial for sustainable tourism development. Previous studies have pointed out that TQM is an important antecedent variable affecting tourism benefits and tourist-perceived quality, but the impact pathways are still unclear. Therefore, based on the literature, this study constructs a theoretical model of "Total Quality Management - Tourism Benefits – Tourist-Perceived Quality - Sustainable Tourism Development" that deeply analyzes the impact pathways of TQM on sustainable tourism development, explores management methods to promote tourism benefits, enhances overall tourist-perceived quality, and fosters the development of the tourism industry in the Chengdu-Chongqing urban agglomeration.

2. Literature review and research hypotheses

Research on the relationship between total quality management and tourism benefits

Tourism benefits refer to the related economic, social, and environmental benefits that result from the tourism industry. Numerous studies have confirmed that tourism benefits are an important indicator of sustainable tourism development (Streimikiene et al., 2021). Moreover, Achmad et al. (2022) believe that for regional tourism cooperation to achieve sustainability, the tourism industry itself must emphasize these long-term benefits, thereby fostering better development of regional tourism cooperation. From the perspective of the government's ecological management, Xiao (2021) proposed countermeasures and suggestions for the sustainable development of rural tourism. By exploring the relationship between sustainable development of rural tourism and the ecological management of the government, Xiao divided the sustainable development of rural tourism into four measurement dimensions: tourism resources, tourism benefits, tourism operations, and tourism support systems. Zhou and Yuan (2019) divided the social, economic, and ecological benefits into 15 indicators. They proposed that the ability to attract tourists is the key factor in enhancing the economic benefits of tourism. Based on the literature and theoretical analysis, the following hypothesis is proposed:

H1: Total quality management has a positive impact on tourism benefits.

Research on the relationship between total quality management and tourist-perceived quality

The fundamental objective of total quality management in the tourism industry is to achieve visitor satisfaction. Wu (2023) established the relationship between the dimensions of tourist quality perception

and overall visitor satisfaction, proposing relevant strategies for improving tourism quality. Yan (2023) used an SEM model to explore how overall perception of tourism public services affects tourists' willingness to pay, concluding that strengthening service quality management can help to fulfill perceived customer needs. Sekar and Sudha (2021) discussed tourists' perceptions of hotel service quality and suggested strategies to enhance such service quality. Waridin et al. (2023) examined tourists' perceptions of tourism service quality through empirical cases to promote sustainable tourism development. Nwokorie and Adeniyi (2020) explored tourists' perspectives on ecotourism, providing a theoretical basis for studying the factors influencing tourist perception. Based on the literature and theoretical analysis, the following hypothesis is proposed:

H2: Total quality management has a positive impact on tourist-perceived quality.

Research on the relationship between total quality management and sustainable tourism development

Sustainable development is inseparable from management. In the study by Isaksson et al. (2023), the concept of sustainable development is understood and interpreted from a novel inside-out perspective. Building upon a shared understanding of sustainability and sustainable development, Ramanathan and Isaksson (2023) reframe the viewpoints on sustainable tourism development. In conjunction with the definition of TQM, TQM is broadly categorized into three aspects: total employee involvement, total process management, and total quality management. Previous studies have applied TQM across various areas of the tourism industry, focusing on improving service quality (Razak et al., 2023), adjusting tourism planning (Wang, 2022), promoting employee training and development (Albloushi et al., 2023), and advancing environmental and social responsibility within enterprises (Jum et al., 2023). These efforts collectively aim to drive sustainable development in the tourism sector. Based on the literature and theoretical analysis, the following hypothesis is proposed:

H3: Total quality management has a positive impact on sustainable tourism development.

The intermediary role of tourism benefits

Full participation refers to a concept where communities, local residents, businesses, and other stakeholders actively participate in and share responsibilities and rights in the tourism development process. Through full stakeholder involvement, sustainable tourism development can be better achieved, ensuring that benefits are distributed more widely and equitably. Wang et al. (2024) argued that empowering communities and ensuring local support for participation leads to the equitable distribution of social benefits, thereby influencing sustainable tourism development. Nunkoo et al. (2023) highlighted the significance of social media in studying residents' attitudes towards tourism, as social media engagement can drive tourist interest in destinations and enhance economic benefits for attractions, which will subsequently promote sustainable tourism development. Çelik and Rasoolimanesh (2023) discussed how cost-benefit attitudes mediate between residents' attitudes towards tourism development and their support, emphasizing the direct impact of residents' attitudes on tourism cost-benefit considerations and their close relationship with sustainable tourism development. Based on the literature and theoretical analysis, the following hypothesis is proposed:

H4: There is a partial mediating role of tourism benefits between total quality management and sustainable tourism development.

The mediating role of tourist-perceived quality

Tourist-perceived quality is often discussed as a fundamental concept in the study of tourist behavior (Wu, 2017). Researchers define tourist-perceived quality as the overall judgment based on the feelings elicited by tourists' experiences (Chi, 2020; Chen, 2010). The purpose of total quality management in scenic areas is to achieve tourist satisfaction, thereby attaining sustainable tourism development. Some experts have studied the relationship between the perceived quality of tourism destinations and tourist satisfaction, exploring the specific relationship between the two from multiple perspectives. For example, the perceived quality of a destination has a significant and positive direct impact on tourist satisfaction (Wang et al., 2017), residents' perception of the social impact of tourism and their interpersonal trust make them more attached to and protective of their tourism resources (Ramkissoon, 2023), and the relationship between self-congruity, perceived quality, and satisfaction of a tourism destination is moderated by the mediating role of travel frequency (Tran et al., 2022). Additionally, the relationship between perceived crowding and destination attractiveness is mediated by the roles of risk and experience quality (Yin et al., 2020). Based on the literature and theoretical analysis, the following hypothesis is proposed:

H5: There is a partial mediating effect of tourist-perceived quality between total quality management and sustainable tourism development.
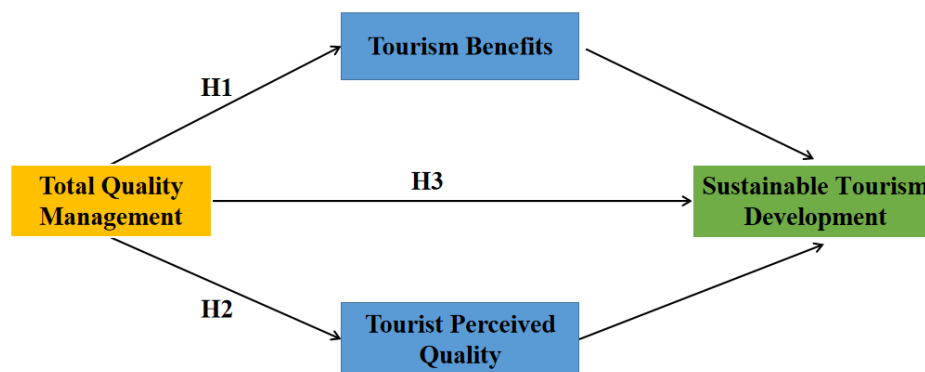

Figure 1 The Conceptual Model and Hypotheses

3. Data sources and variable measurement

Data sources

China's tourist attractions are classified into five quality levels, with AAAAA (5A) being the highest level, representing China's top-quality scenic spots (Zhang, 2022). As of 2023, Sichuan Province has 16 national 5A scenic spots, while Chongqing Municipality has 11 such spots. Both Sichuan Province and Chongqing Municipality are major tourism destinations in China. In terms of the number and quality of tourism resources, they rank among the top level in the country. Their tourism economic benefits also rank high nationwide. Due to the large number of scenic spots, conducting research on all of them poses a significant challenge. 1A and 2A scenic spots might be just a street in a city, while 5A scenic spots are vast, highly endowed with resources, rich in cultural value, and have already reached a certain renown. This makes

them particularly useful for scholarly research. In selecting scenic spot samples for this study, four basic principles were followed: representativeness of the samples, high tourist visitation at the sample scenic spots, even distribution of samples, and coverage of both natural and cultural landscapes. The samples were selected using the stratified sampling method. Based on the above, the author selected 13 scenic spots in the Chengdu-Chongqing urban agglomeration as samples. A total of 700 questionnaires were distributed (see Table 1), with 632 valid responses received.

Regarding gender proportion, there were 330 females, accounting for 52.2%, and 302 males, accounting for 47.8%, showing a minor difference between the two. In terms of age distribution, the largest proportion was in the 18–30 years age group, at 54.4%, while those under 18 and over 50 years old constituted smaller percentages, at 7.3% and 3.3%, respectively. Regarding educational attainment, individuals with college diplomas, bachelor's degrees, master's degrees, and above accounted for 77.8% of the total survey respondents. Based on the above, the survey primarily targeted young and middle-aged adults with generally higher levels of education, indicating they likely have clearer comprehension and discernment abilities. This demographic profile helps ensure a certain level of data quality in the study. In terms of economic income, the highest-ranking category is households with a monthly income of 5,000–10,000 RMB, accounting for 24.7%. The next category is households with a monthly income of 10,000–20,000 RMB, accounting for 24.1%. This indicates that the survey respondents possess a significant level of tourism expenditure capacity. From the perspective of respondents' residences and their frequency of visits to the Chengdu-Chongqing region, most respondents are local residents (from Sichuan Province and Chongqing Municipality), and many have visited the area for tourism 3 times or more. Therefore, to maintain and sustain tourism development in the Chengdu-Chongqing urban agglomeration, efforts should be made across various sectors to enhance tourist satisfaction and attract tourists from around the world to visit the scenic spots in the Chengdu-Chongqing urban agglomeration.

Table 1 Distribution Table of Questionnaire Distribution Quantity in the Sample Area

Geographical location of the scenic area	Number of scenic spots	Panoramic view	Proportion of scenic spots (%)	Number of questionnaires distributed (copies)
Chongqing City	4		30.7	214

Chengdu City	1		7.7	54
Mianyang City	1		7.7	54
Guangan City	1		7.7	54
Nanchong City	1		7.7	54
Guangyuan City	1		7.7	54
Yaan City	1		7.7	54
Bazhong City	1		7.7	54
Yibin City	1		7.7	54
Leshan City	1		7.7	54
Total		13	100	700

Research tools

To effectively reflect the impact of total quality management on sustainable tourism development, and the mediating roles of tourism benefits and tourist-perceived quality, this study measured four latent variables: Total quality management, Tourism benefits, Tourist-perceived quality, and Sustainable tourism development. The measurement scales for these variables are presented in Table 2. The questionnaire used a 5-point Likert scale, where responses ranged from 1 to 5, with higher scores indicating greater support from tourists.

The measurement of Total quality management is based on the perspective of Ho et al. (2023), which divides total quality management into full participation, full process management, and comprehensive management. At the same time, based on the measurement scales from Tarí et al. (2020) and Ababneh (2021), and adapted to the specifics of the surveyed region's participants, a total of five items were adopted. The Kaiser-Meyer-Olkin (KMO) measure for Total quality management was 0.881 with a significance level of p < 0.001, and after rotation, all factor loadings were above 0.60.

The measurement of Tourism benefits was adapted from the scale proposed by Godovykh et al. (2023), encompassing ecological benefits, social benefits, and environmental benefits, totaling nine items. The KMO measure for Tourism benefits was 0.949 with a significance level of p < 0.001, and after rotation, all factor loadings were above 0.60.

The measurement scale for Tourists' perceived quality was adapted from Zheng (2021), focusing on aspects such as safety around the scenic area, reputation, and service quality, totaling six items. The KMO measure for Tourist-perceived quality was 0.907 with a significance level of p < 0.001, and after rotation, all factor loadings were above 0.60.

The measurement scale for Sustainable tourism development integrates aspects of achieving equitable development, improving local residents' quality of life, and ensuring sustainable use of resources and the environment. It was adapted from the scales proposed by Huang (2023), Vu (2023), and Hsu et al. (2020), totaling nine items. The KMO measure for Sustainable tourism development was 0.956 with a significance level of p < 0.001, and after rotation, all factor loadings were above 0.60.

Table 2 Variable Measurement

Primary variables	Secondary variables	Measurement items
Total quality management(TQM)	① Full participation ② Full process management ③ Comprehensive management	TQM1 Do you think full participation in quality management affects sustainable tourism development? TQM2 Do you think it is necessary for yourself to participate in tourism quality management? TQM3 Do you think that full participation management in tourist attractions will improve the quality of the attractions? TQM4 Do you think that total process management in tourist attractions will improve the quality of the attractions? TQM5 Do you think it is necessary for tourist attractions to pay attention to safety around the area?
Tourism benefits (TB)	① Ecological benefits ② Social benefits ③ Environmental benefits	TB1 Do you think sustainable development of tourist attractions will increase local residents' income? TB2 Do you think sustainable development of tourist attractions will attract more investment? TB3 Do you think the development of tourist attractions will increase the sales of tourism products?

		TB4 Do you think sustainable development of tourist attractions will increase local employment opportunities?
		TB5 Do you think sustainable development of tourist attractions will improve local transportation conditions?
		TB6 Do you think sustainable development of tourist attractions will protect local traditional culture and ancient architecture?
		TB7 Do you think sustainable development of tourist attractions can improve the environment of tourist areas?
		TB8 Do you think sustainable development of tourist attractions can raise awareness of environmental protection among villagers?
		TB9 Do you think sustainable development of tourist attractions can raise awareness of environmental protection among the government?
Tourist perceived quality (TPQ)	① Safety around the scenic area ② Reputation ③ Service quality	TPQ1 Through this trip, do you experience good transportation and scenic facilities?
		TPQ2 Through this trip, do you encourage more people to visit the Chengdu-Chongqing region?
		TPQ3 Through this trip, do you think the effectiveness of the scenic spots needs further improvement?
		TPQ4 Through this trip, do you think the safety around the scenic area is important?
		TPQ5 Are you satisfied with this trip compared to other trips?
		TPQ6 Do you think this trip is worth it (in terms of cost, time, etc.)?
Sustainable tourism development (STD)	① Achieving fair development ② Improving the quality of life of local residents ③ Promoting sustainable development of resources and the	STD1 Do you think local residents need to receive promotion and education on "environmental protection"?
		STD2 Do you think it is necessary to receive education on the "Civilized Tourism Conventions of Chengdu City" and "Civilized Tourism Conventions of Chongqing City"

environment	before traveling?
	STD3 Do you believe that tourism attractions in the Chengdu-Chongqing urban agglomeration can continuously improve service quality?
	STD4 Do you believe that tourism will increase local residents' economic benefits and job opportunities?
	STD5 Do you believe that tourism attractions in the Chengdu-Chongqing urban agglomeration can continuously improve tourism quality?
	STD6 Would you revisit this scenic route?
	STD7 Would you recommend this route to family, friends, classmates, or colleagues?
	STD8 Did your visit to this tourist attraction not adversely affect the local ecosystem and maintain basic ecological processes?
	STD9 Do you believe that by protecting the natural environment and cultural relics of tourist attractions, they can be sustainably used for tourism in the future?

Data processing and analysis

SPSS 26.0 was used for correlation analysis of the four variables: Total quality management, Tourism benefits, Tourist-perceived quality, and Sustainable tourism development. AMOS 24.0 was used for the structural equation modeling to test the hypothesis paths.

Empirical analysis

Common Method Bias Testing

Based on the rotated exploratory factor analysis, four factors with eigenvalues greater than 1 were extracted, and the largest factor explained 38.630% of the variance, which is less than 40%. Therefore, there appears to be no significant issue of common method bias in the data used for this study.

Reliability and Validity Testing

Firstly, using SPSS 26.0, reliability testing was conducted on each latent variable. As shown in Table 3, the Cronbach's α coefficients for all latent variables exceed 0.7, indicating good internal consistency among items and the high reliability of the sample. Secondly, using AMOS 24.0, confirmatory factor analysis was performed to assess the questionnaire validity. According to the results, the standardized factor loadings for each latent variable's corresponding items were all above 0.6, average variance extracted (AVE) values for all latent variables exceeded 0.5, and composite reliability (CR) values exceeded 0.8, indicating

satisfactory convergent validity.

Table 3 Reliability and Validity Testing

Items	Factor Loading	Cronbach's α	AVE	CR
TQM1	0.78			
TQM2	0.74			
TQM3	0.79	0.885	0.606	0.885
TQM4	0.80			
TQM5	0.78			
TB1	0.73			
TB2	0.75			
TB3	0.77			
TB4	0.75			
TB5	0.72	0.925	0.583	0.926
TB6	0.73			
TB7	0.76			
TB8	0.84			
TB9	0.82			
TPQ1	0.76			
TPQ2	0.74			
TPQ3	0.78			
TPQ4	0.81	0.898	0.597	0.899
TPQ5	0.75			
TPQ6	0.79			
STD1	0.69			
STD2	0.72			
STD3	0.71			
STD4	0.81			
STD5	0.79	0.925	0.580	0.925
STD6	0.78			
STD7	0.76			
STD8	0.80			
STD9	0.78			

Correlation analysis

The linear relationships between two variables can be detected through correlation analysis in SPSS. The larger the correlation coefficient, the stronger the relationship. Table 4 shows that, through correlation analysis of each latent variable of Total quality management, Tourism benefits, Tourist-perceived quality, and Sustainable tourism development, coefficients ranging from 0.443 to 0.580 are significantly correlated ($p < 0.005$). These coefficients are also smaller than the corresponding square roots of the Average Variance

Extracted (AVE), indicating sufficient discriminant validity among the latent variables. The scale data demonstrates good discriminant validity, supporting the research hypotheses and the suitability for further analysis.

Table 4 Validity Analysis

Variable	TQM	TB	TPQ	STD
TQM	0.779			
TB	0.443***	0.763		
TPQ	0.468***	0.439***	0.772	
STD	0.420***	0.580***	0.522***	0.762

Note: *** significant correlation at the 0.005 level.

Hypothesis testing

Firstly, AMOS 24.0 was used to perform the CFA validation of various variables (Figure 2), and the results showed that the indicators were CMIN/DF = 1.383, GFI = 0.950, AGFI = 0.941, NFI = 0.955, IFI = 0.987, TLI = 0.986, CFI = 0.987, RMSEA = 0.025, indicating a good fit of the data. Continuing to use AMOS 24.0 to establish a result equation model, the results showed that each indicator was CMIN/DF = 1.494, GFI = 0.946, AGFI = 0.937, NFI = 0.951, IFI = 0.983, TLI = 0.982, CFI = 0.983, RMSEA = 0.028. Path coefficient tests were performed on the overall model (Figure 3), and the significance of the path coefficients was judged based on the magnitude of the p-values.
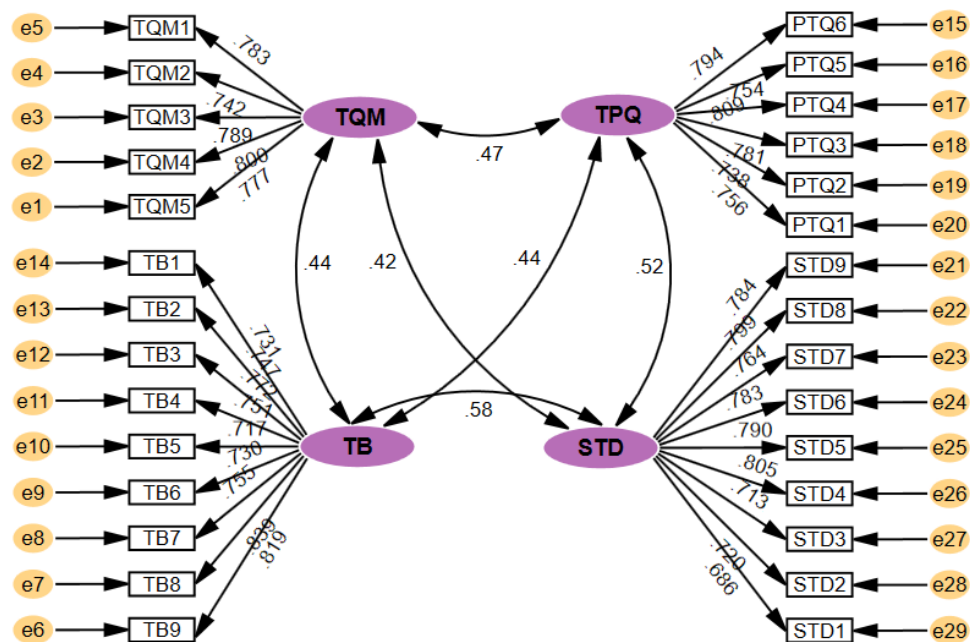

Figure 2 CFA testing of Total quality management, Tourism benefits, Tourist quality perception, and Sustainable tourism development
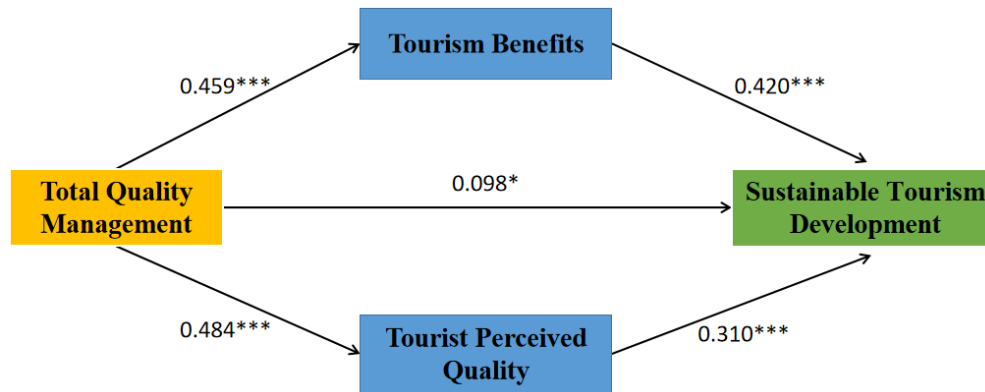
Figure 3 Structural Model of Total quality management, Tourism benefits, Tourist quality perception, and Sustainable tourism development

The analysis of total quality management on tourism benefits ($\beta = 0.459$, $p < 0.001$) shows that total quality management has a significant positive effect on tourism benefits, and hypothesis H1 is supported. The analysis of total quality management on tourist-perceived quality ($\beta = 0.484$, $p < 0.001$) shows that total quality management has a significant positive effect on tourist-perceived quality. Therefore, hypothesis H2 is supported. The analysis of total quality management and sustainable tourism development ($\beta = 0.098$, $p < 0.05$) shows that total quality management significantly positively predicts sustainable tourism development. Thus, hypothesis H3 is supported. The effect value of "Total Quality Management → Tourism Benefits → Sustainable Tourism Development" is significant ($\beta = 0.192$, $p < 0.05$), indicating that tourism benefits play a mediating role between total quality management and sustainable tourism development. Finally, "Total Quality Management → Tourist-Perceived Quality → Sustainable Tourism Development" is significant ($\beta = 0.15$, $p < 0.05$), indicating that tourist-perceived quality plays a mediating role between total quality management and sustainable tourism development.

Table 5 Hypothesis Testing Report

Hypothesis	Std Estimate	p	Results
H1: Total quality management has a positive impact on tourism benefits.	0.448	***	Supported
H2: Total quality management has a positive impact on tourist-perceived quality.	0.528	***	Supported
H3: Total quality management has a positive impact on sustainable tourism development.	0.087	0.038	Supported
H4: Tourism benefits play a partial mediating role between total quality management and sustainable tourism development.	0.193	***	Supported
H5: Tourist-perceived quality has a partial mediating role between total quality management and sustainable tourism development.	0.150	***	Supported

Note: *** indicates significant correlation.

To validate the mediation effects in our research model, the bootstrapping algorithm recommended by Edwards (2007) was used for the mediation analysis. Operations were conducted using AMOS 24.0, setting 5,000 bootstrap samples for testing and a confidence interval of 95%. Given the multiple mediation effects in the model, including serial and parallel mediations, custom syntax in AMOS 24.0 was employed to comprehensively test all mediation effects. In the model, the direct path from "Total Quality Management → Sustainable Tourism Development" had a p-value of 0.026, indicating a significant direct effect. This suggests that tourism benefits partially mediate between total quality management and sustainable tourism development. Tourist-perceived quality also partially mediates between total quality management and sustainable tourism development, accounting for 43.76% and 34.01% of the total effects, respectively (see Table 6).

Table 6 Mediation effect testing report

Path	Std Estimate	SE	Lower	Upper	p	Effect proportion
Standardized direct effect	0.098	0.043	0.009	0.180	0.026	22.22%
(std) TQM→TB→STD	0.193	0.024	0.149	0.245	***	43.76%
（std）TQM→TPQ→STD	0.150	0.023	0.108	0.199	***	34.01%
Standardized total effect	0.441	0.036	0.370	0.509	***	
Standardized total indirect effect	0.343	0.031	0.286	0.408	***	

Note: *** indicates significant correlation.

4. Discussion

The direct impact of total quality management on sustainable tourism development

The research findings indicate that total quality management has a significant positive impact on sustainable tourism development. The implementation of total quality management (TQM) in tourist areas requires the participation of all stakeholders, including employees, tourism-related companies, government agencies, and local residents, in tourism planning and development. This aligns with existing perspectives (Yang et al., 2023; He et al., 2021). TQM emphasizes holistic lifecycle management, and its application in tourism planning and implementation can promote sustainable tourism development (Dangi et al., 2021), particularly through green management practices (Yamagishi et al., 2022). Furthermore, integrating the entire tourism planning process into TQM is advocated (Nie et al., 2022). TQM also necessitates the use of various management approaches, such as human resources management (Andrlić et al., 2022), comprehensive performance management (Al-Hazmi et al., 2020), and safety assessment management (Jin & Liang, 2022), to foster sustainable tourism development. In the process of sustainable tourism development, emphasis should be placed on comprehensive quality management in the tourism industry, particularly through full participation to enhance tourist satisfaction and promote sustainable tourism development.

The direct impact of total quality management on tourism benefits

Research has found that total quality management has a significant positive impact on tourism benefits. Both Drosos et al. (2017) and Sá et al. (2022) have demonstrated a direct positive effect of TQM on tourism benefits. Moreover, related studies indicate that TQM in the tourism industry contributes to achieving social benefits, which often require a long time to materialize. This is particularly crucial for heritage sites, where social benefits are of paramount importance, thus corroborating the findings of this study. In the study of Wang (2023), the development of the tourism industry was comprehensively improved and tourism benefits were achieved through the six major aspects of "food, accommodation, transportation, travel, entertainment, and shopping". Therefore, the application of TQM in the tourism industry is quite important, and its implementation is the best choice. It provides a beneficial reference for how tourist destinations can achieve benefits through management. At the same time, it puts forward higher standards for the management methods and process of the tourism industry requirements.

The direct impact of total quality management on tourist-perceived quality

The research results indicate that total quality management has a significant positive impact on tourist-perceived quality. In the studies of Zaid et al. (2020) and Duan (2023), it was confirmed that TQM has a positive impact on tourist-perceived quality, fully validating the research results. The application of TQM is crucial for the effectiveness of quality assurance management in scenic areas (Al-Ali, 2014). The tourist-perceived quality is precisely reflected in the implementation of total quality management in the tourism industry, which reflects their experience of product quality and service quality, as well as whether tourists want to revisit the area or have the willingness to purchase local products within the scenic areas (Chi et al., 2020). Starting from the perspective of tourist perception, analysis of the perceived value of tourists is conducted based on their needs, with the aim of improving the quality of basic services, applying innovative management methods, and enhancing the tourist experience.

The mediating role of tourism benefits and tourist-perceived quality

This study demonstrates that total quality management not only directly influences sustainable tourism development but also indirectly affects it through tourism benefits and tourist-perceived quality as mediators. Moreover, compared to tourist-perceived quality, the mediating effect of tourism benefits is stronger. This suggests that implementing TQM methods and approaches in tourist destinations can enhance tourism benefits and thereby impact sustainable tourism development. In tourist destinations, under the mechanisms and effects of full participation, full process management, and comprehensive management, tourists can directly perceive the service quality of the attractions. This often leads to tangible expressions of visitor impressions, such as purchasing local products, recommending the destination to friends and relatives, and even revisiting the place (Zhou, 2023). Sustainable tourism development involves multiple aspects, including environmental, social, and economic dimensions. These aspects complement the components encompassed by tourism benefits. Total quality management emphasizes continual improvement in service quality and efficiency, which enhances the competitiveness of the tourism industry. High-quality services not only enhance tourists' experiences and satisfaction but also attract more tourists, thereby increasing tourism revenue (Cheng & Liu, 2017).

Total quality management also emphasizes process improvement and efficient resource utilization, which helps reduce resource waste and adverse environmental impacts. By optimizing management processes and resource utilization, tourism organizations can lower energy consumption and reduce waste emissions, thereby promoting sustainable tourism development (Huang, 2019). Total quality management also emphasizes the involvement of all employees, particularly encouraging them to participate in quality management and continuous improvement processes. Through training and incentives, employees can enhance their skills and qualities, better serving tourists (Long, 2019). Simultaneously, active employee participation enhances their sense of belonging and responsibility to the organization, contributing to improved service quality and customer satisfaction. Previous studies have all demonstrated that total quality management exerts its influence on sustainable tourism development through the mediating roles of tourism benefits and tourist-perceived quality.

The models constructed in this study, namely the Total Quality Management – Tourism Benefits – Sustainable Tourism Development model and the Total Quality Management – Tourist-Perceived Quality – Sustainable Tourism Development model, have effectively validated the mediating roles of tourism benefits and tourist-perceived quality. Therefore, tourism benefits and tourist-perceived quality play crucial intermediary roles between total quality management and sustainable tourism development.

5. Conclusion

Total quality management is a management approach aimed at continuously improving the quality of internal processes, products, and services within organizations in order to meet customer needs and enhance overall organizational performance. In the tourism industry, TQM helps tourism institutions deliver higher quality services and products and enhance customer satisfaction, which thereby promotes sustainable development of the tourism sector. Using innovative thinking and perspectives, this study constructs a structural equation modeling (SEM) framework to examine the impact of total quality management (TQM) on sustainable tourism development (STD). Based on 632 survey responses, the study validates the hypotheses regarding the influence of TQM on STD and employs the bootstrapping algorithm for verification. After analysis and validation, the results indicate that the sample data structure, model construction, and analytical outcomes are accurate, leading to the following three conclusions: (1) Based on the conceptual model hypotheses, this study constructed the Total Quality Management (TQM) – Tourism Benefits (TB) – Sustainable Tourism Development (STD) model and the TQM – Tourist-Perceived Quality (TPQ) – STD model. The mediating roles of tourism benefits and tourist-perceived quality were effectively validated. Variables loadings for TQM, TPQ, TB, and STD were all above 0.7 in the SEM, indicating a good model fit and supporting the hypotheses. Therefore, TQM can be extended to the field of sustainable tourism development.

In addition, the results of the SEM path and effect analysis show that total quality management has a positive impact on sustainable tourism development, TQM positively influences tourism benefits and tourist-perceived quality, and Tourism benefits and tourists' quality perception partially mediate the relationship between TQM and STD, thereby promoting sustainable tourism development. These findings provide important guidance for managing sustainable tourism development, especially for 5A-level scenic areas. For future research in these areas, it is beneficial to further explore existing management methods,

identify shortcomings, and enhance the management capabilities and international competitiveness of China's tourist attractions. This will contribute to promoting sustainable tourism development.

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