

Determinants of Tourist Satisfaction at Lake Toba Destination: Landscape Beauty, Local Atmosphere, and Memorable Experiences

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This study was conducted to examine the factors influencing tourist satisfaction at the Lake Toba Destination, including landscape beauty, local atmosphere, and memorable experiences. A quantitative approach with an associative research design was employed. The study population consisted of tourists visiting the Lake Toba Priority Tourism Destination area. The sample was determined using the accidental sampling technique and the Slovin formula, resulting in 100 respondents. Data were collected through the distribution of Likert-scale questionnaires, while data analysis included classical assumption tests, multiple linear regression analysis, partial tests, simultaneous tests, and the coefficient of determination. The results revealed that landscape beauty and local atmosphere each have a positive and significant effect on tourist satisfaction. Memorable experiences were identified as the most dominant variable contributing to increased tourist satisfaction. Simultaneously, the three variables significantly influenced tourist satisfaction, with an R Square value of 0.604. These findings indicate that tourist satisfaction at Lake Toba is shaped by the integration of natural attractions, the destination's atmosphere, and meaningful travel experiences. The study highlights the importance of experience-oriented destination management through landscape enhancement, strengthening local cultural identity, improving service quality, and developing tourism activities that create lasting impressions and encourage repeat visits.

Keywords: Landscape Beauty, Local Atmosphere, Memorable Experiences, Tourist Satisfaction, Lake Toba.

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1. Introduction

The transformation of the tourism industry requires destinations not only to showcase their physical attractions but also to provide travel experiences that enhance tourist satisfaction (Alfaathir Basra, 2023). Tourists' evaluations of a destination are shaped by various factors, including the quality of the scenery, the atmosphere they experience, interactions during their visit, and the lasting impressions formed after the trip (Harahap et al., 2024). Tourist satisfaction plays a strategic role in destination marketing because satisfying experiences encourage positive reviews, recommendations to potential visitors, and intentions to revisit the destination (Setyawan & Mardalis, 2023). This aspect is also crucial for the sustainable development of Lake Toba tourism, as tourist satisfaction contributes to building visitor loyalty. Fadli et al. (2021) found that tourist satisfaction strengthens the effect of marketing communication on visitor loyalty at Lake Toba.

Lake Toba is one of Indonesia's leading tourist destinations, renowned for its spectacular natural scenery, rich cultural heritage, and memorable travel experiences. The enactment of Presidential Regulation No. 89 of 2024 concerning the National Tourism Destination Master Plan for Lake Toba (2024–2044) further reinforces the area's status as a National Tourism Destination. This regulation demonstrates that Lake Toba is positioned not merely as a nature-based tourist attraction but also as a strategic tourism area requiring integrated management across tourism development, infrastructure, environmental sustainability, socio-cultural preservation, and regional development.

The increasing number of tourists visiting the Lake Toba region reflects positive growth in the destination's tourism sector. According to tourism statistics published for Lake Toba, domestic tourist trips reached 6,317,303 during the period of January to August 2024, representing a 6.69% increase compared with the corresponding period of the previous year. Most domestic visitors originated from Medan City, contributing 21.54% of total visits, followed by Deli Serdang Regency (13.74%) and Pematang Siantar City (6.47%). International tourist arrivals to the Lake Toba Super Priority Tourism Destination also increased, with their proportion rising from 3.33% in the first quarter of 2024 to 4.98% in the second quarter of the same year.

Table 1. Growth in Tourist Arrivals at the Lake Toba Destination, 2024–2025

Year	Number/Proportion of Tourist Arrivals	Description
2024	6,317,303 domestic tourist trips	Increased by 6.69% compared with the same period of the previous year
	3.33% international tourist proportion	Baseline proportion of international tourist arrivals to the Lake Toba Super Priority Tourism Destination (SPTD)
	4.98% international tourist proportion	Increased by 1.65 percentage points from the first quarter of 2024
2025	3.20 million domestic tourists	Increased by 15.30% from 2.77 million in the first half of 2024
	133,513 international tourist arrivals through Kualanamu International Airport	Increased by 14.10% compared with the previous year

Source: Lake Toba Tourism Office, 2025.

The data presented above indicate that Lake Toba has a strong visitor base, particularly among domestic tourists, while also demonstrating a gradual increase in the proportion of international visitors. This trend provides an opportunity for destination managers not only to increase tourist arrivals but also to enhance the overall quality of the visitor experience. The growth in tourist arrivals should therefore be accompanied by effective management of the destination's landscape, local atmosphere, services, and attractions to ensure high levels of tourist satisfaction. Tourist satisfaction at the Lake Toba Destination can be understood through three key dimensions: landscape beauty, local atmosphere, and memorable experiences. Landscape beauty constitutes a fundamental aspect because Lake Toba offers remarkable visual attractions, including its vast lake, surrounding hills, panoramic views of Samosir Island, cool climate, and scenic viewpoints that create strong first impressions. Such compelling visual experiences can evoke feelings of admiration, comfort, and satisfaction by providing tourists with a natural environment that differs significantly from their daily routines. Strong tourism experiences are developed through tourists' interactions with the destination, service quality, and memorable experiences (Tabaeeian et al., 2023).

The local atmosphere is another important determinant because destinations are evaluated not only by the attractions tourists observe but also by the atmosphere they experience throughout their visit. At Lake Toba, the local atmosphere is reflected in the hospitality of local communities, Batak culture, traditional cuisine, local language, music, traditional houses, community activities, and the everyday life surrounding the destination. Interactions between tourists and local residents contribute to more authentic and enjoyable travel experiences (Blanco-González et al., 2023). Host–guest interactions have also been found to positively influence perceived enjoyment and behavioral intention among tourists visiting destinations in North Sumatra (Nasib et al., 2026). Memorable experiences have become increasingly important in destination marketing because tourists tend to remember their journeys through emotionally meaningful moments (Thipsingh et al., 2022). Such experiences may arise when tourists enjoy natural scenery, participate in cultural activities, sample local cuisine, receive friendly service, or encounter travel experiences

that differ from their previous trips (Hasan, 2024). Furthermore, service quality has been shown to have a positive relationship with customer satisfaction in the context of ethnic culinary tourism, suggesting that tourism experiences involving hospitality, traditional food, and cultural ambience contribute significantly to the formation of tourist satisfaction (Dewi et al., 2025).

Previous studies on Lake Toba have primarily examined marketing communication, destination image, trust, and tourist loyalty. Fadli et al. (2021) found that marketing communication significantly influences visitor satisfaction at Lake Toba, while Novirsari and Pranata (2021) reported that brand image and brand trust play important roles in developing visitor loyalty. In addition, destination image and perceived value have been found to support customer loyalty. Nevertheless, studies that specifically examine landscape beauty, local atmosphere, and memorable experiences as determinants of tourist satisfaction at Lake Toba remain limited and require further investigation (Amelia & Ayani, 2020).

The novelty of this study lies in its integrated examination of landscape beauty, local atmosphere, and memorable experiences as determinants of tourist satisfaction at the Lake Toba Destination. This study conceptualizes Lake Toba not merely as a destination characterized by its natural attractions but as a tourism experience shaped by the integration of scenic landscapes, local culture, social interactions, and the lasting impressions gained throughout the journey. Based on this framework, the study aims to analyze the effects of landscape beauty, local atmosphere, and memorable experiences on tourist satisfaction at the Lake Toba Destination.

2. Methods

This study employed a quantitative approach using an associative research design. A quantitative approach was selected because the study aimed to examine the effects of landscape beauty, local atmosphere, and memorable experiences on tourist satisfaction at the Lake Toba Destination (Wallwey & Kajfez, 2023). An associative research design was adopted to investigate the relationships between the independent and dependent variables using statistical analysis procedures (Creswell & Guetterman, 2018). The object of this study was tourism activities at the Lake Toba Destination, while the research subjects consisted of tourists who had visited the destination. The study population comprised all tourist trips to the Lake Toba Priority Tourism Destination. Based on data from Statistics Indonesia (BPS), processed by the Ministry of Tourism, the number of domestic tourist trips reached 4,857,238 during January–June 2024 and increased to 6,059,673 during the same period in 2025. Accordingly, the population used as the basis for this study consisted of 10,916,911 tourist trips.

The sample size was determined using the Slovin formula with a margin of error of 10%. Based on the population of 10,916,911 tourist trips, the calculation yielded a required sample size of 99.99 respondents, which was rounded to 100 respondents. Therefore, the study sample consisted of 100 tourists who had previously visited the Lake Toba Destination. Data were collected using a structured questionnaire based on a five-point Likert scale, ranging from strongly disagree to strongly agree. The independent variables included landscape beauty, local atmosphere, and memorable experiences, while tourist satisfaction served as the dependent variable.

The data were analyzed through several stages, including instrument testing, descriptive statistical analysis, assessment of regression assumptions, and hypothesis testing (Mellinger & Hanson, 2026). Instrument quality was evaluated through validity testing to ensure that each questionnaire item accurately measured its intended construct, while reliability testing was conducted to assess the consistency of respondents' answers. Before estimating the regression model, the data were examined using classical assumption tests, including tests of normality, multicollinearity, and heteroscedasticity. The relationships among the study

variables were then analyzed using multiple linear regression. Hypotheses were tested using partial (t) tests to determine the individual contribution of each independent variable to tourist satisfaction and simultaneous (F) tests to evaluate the combined effects of landscape beauty, local atmosphere, and memorable experiences. Finally, the coefficient of determination (R^2) was employed to measure the proportion of variance in tourist satisfaction at the Lake Toba Destination explained collectively by the independent variables included in the research model (Hair, 2014).

3. Results

Respondent Characteristics

The characteristics of the 100 respondents were classified according to gender, age, place of origin, and frequency of visits to the Lake Toba Destination.

Table 2. Respondent Characteristics

Characteristic	Category	Frequency	Percentage
Gender	Male	42	42.0%
	Female	58	58.0%
Age	17–25 years	37	37.0%
	26–35 years	34	34.0%
	36–45 years	19	19.0%
	>45 years	10	10.0%
Tourist Origin	North Sumatra	61	61.0%
	Outside North Sumatra	32	32.0%
	International	7	7.0%
Frequency of Visits	Once	44	44.0%
	2–3 times	39	39.0%
	More than 3 times	17	17.0%

Source: Processed Data, 2026.

Table 2 shows that the respondents were predominantly female (58.0%), aged 17–25 years (37.0%), originated from North Sumatra (61.0%), and most had visited Lake Toba only once (44.0%).

Classical Assumption Test Results

Table 3. Results of the One-Sample Kolmogorov–Smirnov Normality Test

Description	Unstandardized Residual
N	100
Normal Parameters Mean	0.0000000
Normal Parameters Std. Deviation	2.145
Most Extreme Differences Absolute	0.071
Most Extreme Differences Positive	0.054
Most Extreme Differences Negative	-0.071
Test Statistic	0.071
Asymp. Sig. (2-tailed)	0.200
Criterion	> 0.05
Conclusion	Normally Distributed

Source: Processed Data, 2026.

The Asymp. Sig. value of 0.200, which is greater than 0.05, indicates that the residuals are normally distributed. Therefore, the regression model satisfies the normality assumption.

Table 4. Multicollinearity Test Results

Model	Variable	Tolerance	VIF	Conclusion
1	Landscape Beauty	0.621	1.610	No multicollinearity detected
1	Local Atmosphere	0.684	1.462	No multicollinearity detected
1	Memorable Experiences	0.598	1.672	No multicollinearity detected

Source: Processed Data, 2026.

Table 4 shows that all independent variables have tolerance values greater than 0.10 and Variance Inflation Factor (VIF) values below 10. These results indicate that the regression model is free from multicollinearity, confirming that the independent variables are not highly correlated with one another.

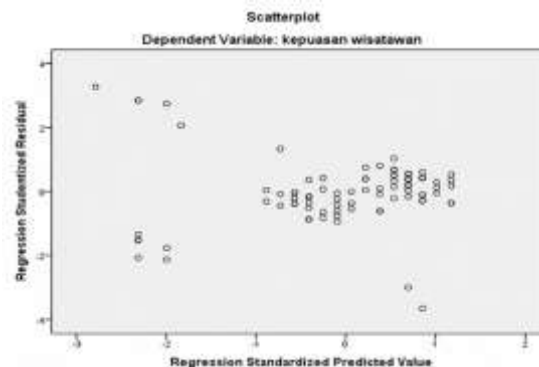


Figure 1. Results of the Heteroscedasticity Test

Heteroscedasticity Test Results

Based on the results of the heteroscedasticity test, the regression model does not exhibit any indication of heteroscedasticity. Therefore, the data satisfy the homoscedasticity assumption and are appropriate for multiple linear regression analysis, with tourist satisfaction serving as the dependent variable.

Multiple Linear Regression Analysis

Multiple linear regression analysis was performed to examine the effects of landscape beauty, local atmosphere, and memorable experiences on tourist satisfaction at the Lake Toba Destination.

Table 5. Results of the Multiple Linear Regression Analysis

Model	Variable	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
1	Constant	4.126	1.214	–	3.399	0.001
1	Landscape Beauty	0.284	0.088	0.287	3.214	0.002
1	Local Atmosphere	0.251	0.087	0.243	2.876	0.005
1	Memorable Experiences	0.397	0.085	0.421	4.685	0.000

Source: Processed Data, 2026.

Based on the results presented in Table 5, the multiple linear regression equation can be expressed as follows:

$$Y = 4,126 + 0,284X_1 + 0,251X_2 + 0,397X_3$$

The constant value of 4.126 represents the level of tourist satisfaction when all independent variables are assumed to be zero. The positive coefficients for landscape beauty, local atmosphere, and memorable

experiences indicate that improvements in each of these variables lead to higher levels of tourist satisfaction. Among the three independent variables, memorable experiences exert the strongest influence, as indicated by the highest regression coefficient (0.397).

Partial (t) Test Results

The results of the partial (t) tests are presented in Table 6.

Table 6. Partial (t) Test Results

Model	Variable	t	Sig.	Criterion
1	Landscape Beauty	3.214	0.002	Sig. < 0.05
1	Local Atmosphere	2.876	0.005	Sig. < 0.05
1	Memorable Experiences	4.685	0.000	Sig. < 0.05

Source: Processed Data, 2026.

The partial test results presented in Table 6 indicate that landscape beauty has a positive and statistically significant effect on tourist satisfaction ($t = 3.214$, $p = 0.002$). Similarly, local atmosphere exerts a positive and significant effect on tourist satisfaction ($t = 2.876$, $p = 0.005$). Memorable experiences demonstrate the strongest positive and significant influence, with a t value of 4.685 and a significance level of 0.000, confirming that memorable experiences are the most influential determinant of tourist satisfaction among the variables examined.

Simultaneous (F) Test Results

The results of the simultaneous (F) test are presented in Table 7.

Table 7. Simultaneous (F) Test Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	626.314	3	208.771	48.672	0.000
Residual	411.926	96	4.291	–	–
Total	1,038.240	99	–	–	–

Source: Processed Data, 2026.

The results of the simultaneous (F) test presented in Table 7 show an F value of 48.672 with a significance level of 0.000, which is lower than the threshold of 0.05. These findings demonstrate that landscape beauty, local atmosphere, and memorable experiences jointly exert a statistically significant effect on tourist satisfaction at the Lake Toba Destination.

Coefficient of Determination (R^2) Results

The results of the coefficient of determination analysis are presented in Table 8.

Table 8. Coefficient of Determination (R^2) Results

Model	R	$RSquare$	Adjusted $RSquare$	Std. Error of the Estimate
1	0.777	0.604	0.592	2.071

Source: Processed Data, 2026.

Table 8 shows an R value of 0.777, indicating a strong relationship between landscape beauty, local atmosphere, memorable experiences, and tourist satisfaction. The coefficient of determination (R^2) is 0.604, indicating that the three independent variables collectively explain 60.4% of the variation in tourist satisfaction. The remaining 39.6% is attributable to other factors not included in the model, such as tourism facilities, accessibility, pricing, safety, promotional activities, and service quality.

Discussion

The Effect of Landscape Beauty on Tourist Satisfaction

The findings demonstrate that landscape beauty has a positive and statistically significant effect on tourist satisfaction at the Lake Toba Destination, as indicated by a significance value of 0.002, which is below the 0.05 threshold. This finding suggests that the panoramic lake views, surrounding hills, visually clean environment, and the comfort experienced while enjoying the scenery play important roles in shaping visitors' satisfaction. Landscape attractiveness also serves as the first element to create a lasting impression by providing tourists with visual experiences that differ from their daily routines. In practice, these findings imply the importance of developing and maintaining scenic viewpoints, preserving environmental cleanliness, improving visitor pathways, providing adequate rest areas, and managing photography spots while ensuring environmental sustainability. Destination managers should maintain the visual quality of the area so that the beauty of Lake Toba can be enjoyed optimally from various viewing locations.

These findings are consistent with the study by Goeltom and Hurriyati (2024), which reported that destination attractiveness plays a significant role in shaping tourists' travel intentions through destination image and cultural experiences. Similarly, Risfandini (2024) emphasized that landscape quality constitutes an essential component in the evaluation of natural tourism destinations. Previous studies further confirm that landscape is not merely an aesthetic attribute but also an integral component of the destination experience that influences tourists' overall evaluations (Rahayu & Atmanto, 2024). The practical implication of this study is that the scenic beauty of Lake Toba should be regarded as a primary asset in destination marketing. Maintaining a clean, attractive, and well-managed landscape will strengthen tourist satisfaction while enhancing Lake Toba's image as one of Indonesia's premier nature-based tourism destinations.

The Effect of Local Atmosphere on Tourist Satisfaction

The results indicate that the local atmosphere has a positive and statistically significant effect on tourist satisfaction, as evidenced by a significance value of 0.005, which is below the 0.05 level. This finding suggests that the hospitality of local residents, the richness of Batak culture, traditional cuisine, everyday community activities, and the authenticity of the destination's atmosphere significantly influence visitors' satisfaction. Tourists visit Lake Toba not only to enjoy its natural scenery but also to experience the identity and daily life of the local community. These findings suggest that destination managers should strengthen Batak cultural attractions, increase community participation in tourism activities, improve the quality of services provided by tourism businesses, enhance traditional culinary offerings, and create more authentic tourism experiences. A welcoming and vibrant destination atmosphere can foster stronger emotional connections between tourists and Lake Toba, making their travel experiences more meaningful and memorable.

These findings are consistent with Djabbar et al. (2025), who reported a positive relationship between service quality and customer satisfaction in the context of ethnic culinary businesses. This relationship is highly relevant to Lake Toba tourism because the local atmosphere is shaped not only by cultural elements but also by hospitality, traditional cuisine, and direct interactions between visitors and tourism stakeholders (Dewi et al., 2025). Furthermore, Nasib et al. (2026) found that host-guest interactions positively influence perceived enjoyment and behavioral intentions among tourists visiting destinations in North Sumatra. These findings highlight the importance of positioning local communities as key contributors to destination experiences. Tourist satisfaction at Lake Toba can therefore be further enhanced by integrating local culture, traditional cuisine, community hospitality, and regional activities into a cohesive tourism experience.

The Effect of Memorable Experiences on Tourist Satisfaction

The findings reveal that memorable experiences have a positive and statistically significant effect on tourist satisfaction, as indicated by a significance value of 0.000, which is well below the 0.05 significance level. This variable also produced the highest regression coefficient (0.397), indicating that it is the most influential factor in enhancing tourist satisfaction. These results suggest that unique experiences, emotional attachment, travel comfort, and lasting memories play crucial roles in shaping visitors' satisfaction at Lake Toba. In practical terms, these findings support the development of experience-based tourism packages that include cultural activities, storytelling about the history and legends of Lake Toba, traditional culinary experiences, local festivals, nature-based activities, and personalized services. Memorable experiences should be managed comprehensively throughout the entire visitor journey, from arrival to departure.

The results are consistent with the findings of Shabrina et al. (2024), who reported that memorable tourism experiences significantly influence tourist satisfaction at Lake Ranau, a natural tourism destination. Their study also demonstrated that memorable tourism experiences and tourist satisfaction are closely associated with revisit intentions in the context of ecotourism in Indonesia. Likewise, Sari et al. (2025) confirmed that memorable experiences are important determinants of both tourist satisfaction and post-visit behavioral intentions. The practical implication of the present study is that Lake Toba should not be promoted solely as a destination with beautiful natural scenery. Instead, destination managers should focus on creating meaningful experiences that tourists can remember, share on social media, and recommend to others through positive word-of-mouth, thereby strengthening the destination's long-term competitiveness.

The Combined Effects of Landscape Beauty, Local Atmosphere, and Memorable Experiences on Tourist Satisfaction

The simultaneous analysis demonstrates that landscape beauty, local atmosphere, and memorable experiences collectively have a positive and statistically significant effect on tourist satisfaction, as indicated by the significance value of 0.000, which is below the 0.05 threshold. The coefficient of determination (R^2) of 0.604 indicates that these three variables jointly explain 60.4% of the variation in tourist satisfaction, while the remaining 39.6% is attributable to other factors not examined in this study, such as tourism facilities, accessibility, pricing, safety, promotional activities, and service quality. These findings suggest that tourist satisfaction at Lake Toba is not determined by a single factor but rather by the integration of natural attractions, the destination's local atmosphere, and the memorable experiences gained throughout the visit. The practical implementation of these findings requires an integrated destination management approach that emphasizes landscape preservation, strengthening local identity, improving service quality, and developing tourism activities capable of creating lasting impressions. These elements should be managed holistically because tourists evaluate the destination throughout the entire travel experience from their arrival, appreciation of the scenery, interactions with local communities, participation in tourism activities, to their recollection of the experience after returning home.

The findings are supported by Fadli et al. (2021), who reported that tourist satisfaction plays a crucial role in fostering visitor loyalty at Lake Toba. Likewise, Novirsari and Pranata (2021) found that brand image and brand trust significantly contribute to visitor loyalty at the destination. Furthermore, Dewi et al. (2025) emphasized that service quality, social interactions, and tourism experiences are essential elements in generating positive tourist responses toward a destination. The implications of this study suggest that the future development strategy for Lake Toba should adopt an experience-based marketing approach. Lake Toba should be promoted not only as a destination with exceptional natural beauty but also as a destination offering a distinctive local atmosphere, warm hospitality, authentic cultural experiences, and memorable travel experiences that encourage satisfaction and long-term visitor loyalty.

4. Conclusion

The findings indicate that tourist satisfaction at the Lake Toba Destination is positively and significantly influenced by landscape beauty, local atmosphere, and memorable experiences. The destination's visual appeal including the panoramic lake views, surrounding hills, environmental cleanliness, and the comfort of enjoying the scenery plays an essential role in shaping tourists' initial perceptions. Tourist satisfaction is further enhanced by the destination's local atmosphere, reflected in the hospitality of local communities, the richness of Batak culture, traditional cuisine, everyday community activities, and the authenticity of the destination. Among the three independent variables, memorable experiences make the greatest contribution to tourist satisfaction because they foster emotional attachment, shape meaningful travel stories, and create lasting positive memories after the visit. The simultaneous analysis confirms that all three variables significantly influence tourist satisfaction. The coefficient of determination (R^2) of 0.604 indicates that landscape beauty, local atmosphere, and memorable experiences jointly explain 60.4% of the variation in tourist satisfaction, while the remaining 39.6% is influenced by other factors beyond the scope of this study, including tourism facilities, accessibility, pricing, safety, promotional activities, and service quality. These findings suggest that the future development of Lake Toba should prioritize experience-oriented destination management through landscape conservation, strengthening local identity, community empowerment, continuous improvement of service quality, and the development of tourism activities that create memorable and meaningful experiences for visitors.

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