

Factors Influencing Local Communities' Intention to Support Sustainable Tourism Development in the Lake Toba Super-Priority Destination

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Abstrak

This study aims to analyze the influence of local residents' perceptions of economic, sociocultural, and environmental impacts on their support for sustainable tourism development in Lake Toba, one of Indonesia's super-priority destinations. A quantitative approach was employed, with data collected through questionnaires distributed to local communities around the Toba Caldera. The data were analyzed using Structural Equation Modeling (SEM) with SmartPLS. The findings reveal that all three factors—economic, sociocultural, and environmental impacts, significantly affect residents' support, with sociocultural impact emerging as the most dominant factor. These results confirm the relevance of Social Exchange Theory, indicating that community support increases when perceived economic, social, and environmental benefits outweigh potential costs. The study provides policy implications suggesting that sustainable tourism development should adopt a holistic approach that balances economic opportunities, environmental preservation, and the strengthening of local cultural identity.

Kata Kunci: *Sustainable Tourism, Lake Toba, Economic Impact, Sociocultural Impact, Environmental Impact.*

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INTRODUCTION

Tourism is one of the leading sectors that makes a substantial contribution to national economic growth (Baig et al., 2024). It offers various economic opportunities for local communities, including employment prospects for youth and women, opportunities to establish enterprises, and the attraction of investments that enhance sectors such as transportation, telecommunications, and healthcare (Kim et al., 2025). When effectively managed and accompanied by genuine community participation, tourism can provide improved livelihoods for local residents while simultaneously contributing to ecological conservation and sociocultural development.

Sustainable tourism development represents a strategic approach that not only pursues economic growth but also ensures the sustainability of natural resources, cultural heritage, and the well-being of local communities. The Indonesian Ministry of Tourism and Creative Economy has designated several super-priority destinations, one of which is Lake Toba in North Sumatra Province. This designation has positioned Lake Toba as a central focus for infrastructure development, tourism promotion, and investment. Lake Toba is not only endowed with extraordinary

natural beauty but also possesses a rich and unique cultural heritage. However, in maintaining its status as a world-class destination, significant challenges arise regarding how to ensure that tourism development proceeds in a sustainable manner and actively involves local communities.

One destination within Lake Toba that has gained global recognition is the Toba Caldera, which was designated as a UNESCO Global Geopark in 2020. This recognition entails responsibility for preserving the broader Lake Toba environment. According to Zhang et al. (2025), local communities play a pivotal role in tourism and cultural sustainability through their influence in preserving, adapting, transforming, and transmitting cultural heritage. From the perspective of existing literature, perceived economic benefits such as job creation and increased income serve as significant predictors of residents' support for sustainable tourism (Hsu & Chen, 2019; Ngowi & Jani, 2018). Uslu et al. (2023) further argue that cultural preservation motivates communities to engage in sustaining tourism. Similarly, environmental protection and sustainability efforts have a positive impact on residents' support for sustainable tourism (Iqbal et al., 2023).

Table 1. Tourist Arrival Data at the Lake Toba Super-Priority Destination (DSP) in 2024

Destination	2023	2024	Growth 2024 vs 2023 (%)
Kabupaten Tapanuli Utara	726,194	751,225	3.45
Kabupaten Toba Samosir	928,851	1,506,208	62.16
Kabupaten Simalungun	1,686,176	2,595,069	38.91
Kabupaten Dairi	698,228	719,807	3.10
Kabupaten Karo	2,739,067	2,305,891	-15.81
Kabupaten Humbang Hasundutan	429,675	463,475	7.87
Kabupaten Pakpak Bharat	87,850	116,321	32.35
Kabupaten Samosir	866,682	786,746	-9.22

Based on available data, the majority of tourism sites in the Lake Toba super-priority destination (DSP Toba) experienced an increase in tourist visits between 2023 and 2024. As these destinations are predominantly nature-based, environmental preservation efforts are essential to ensure the continuity of tourism in the region. Sustainable tourism is defined as meeting the needs of present tourists while taking all necessary measures to protect host areas and enhance future opportunities. It represents a means of fostering economic growth without harming local communities or their environment. In terms of the environmental dimension, nature is a vital resource for the tourism industry, and its depletion poses a serious threat to destination sustainability (Eslami et al., 2019).

Previous studies demonstrate that local residents' intentions to support sustainable tourism are influenced by multiple factors, including perceived economic benefits, sociocultural benefits, and environmental impacts (Nunkoo & Gursoy, 2012;

Rasoolimanesh et al., 2017). When local residents perceive fair benefits, are actively involved in planning processes, and do not experience environmental or cultural degradation, they are more likely to offer strong support for tourism initiatives.

In certain contexts, however, local communities face concerns about marginalization, environmental degradation, or insufficient involvement in decision-making processes. Hence, there is a need for a scientific approach to gain a deeper understanding of how perceived economic, sociocultural, and environmental impacts shape residents' intentions to support sustainable tourism programs (Jasrotia et al., 2024). Addressing this research gap, the present study seeks to examine the influence of these factors on local communities' willingness to support sustainable tourism development.

METHOD

This study employed a quantitative approach to capture residents' perspectives, with data collected from communities living around Lake Toba, particularly those located in regencies within the Toba Caldera area. Structural Equation Modeling (SEM) was applied to test the hypotheses. According to Hair et al. (2010), the required sample size for SEM should be 5–10 times the number of observed variables. In total, 18 variables were associated with the research hypotheses; therefore, this study required at least 180 respondents.

The questionnaire instrument was developed based on a review of literature concerning residents' attitudes and opinions toward sustainable tourism, and a survey tool was specifically designed for this study. The data collection process involved several key steps, including research design, selection of appropriate data collection instruments, pilot testing, implementation of data collection methods, data recording, and statistical analysis using appropriate techniques. Furthermore, adherence to ethical principles was essential to ensure informed consent, confidentiality, and participant privacy (Reja et al., 2003).

The questionnaire consisted of two sections. The first section aimed to collect demographic information, including age, gender, education level, and occupation. The second section gathered information on participants' perspectives regarding various dimensions such as environmental sustainability (Ribeiro et al., 2013), cultural sustainability (Chen & Chen, 2010), economic sustainability (Eslami et al., 2019), and residents' support (Nunkoo & Gursoy, 2012). Participants were carefully selected by the research team, particularly those actively involved in sustainable tourism development in the region (Bryman, 2016). This iterative process ensured that the final version of the questionnaire was reliable, valid, and capable of capturing representative data.

RESULT AND DISCUSSION

Based on the questionnaires distributed to respondents through Google Forms, the responses obtained were as follows:

Table 1. Questionnaire Return Rate

Information	Amount	Percentage
Total questionnaires	117	100%
Inappropriate questionnaires	8	6,8%

Analyzed questionnaires	109	93,2%
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Based on the questionnaire results, the response rate was found to be 93.2%, which represents a relatively high percentage achieved through targeted distribution. The questionnaire link was shared via WhatsApp groups and other social media platforms used by communities around Lake Toba. Consequently, the respondents were demographically aligned with the criteria established by the researchers, namely local residents directly affected by tourism in the Lake Toba area.

In the next stage, the collected data were tested for their appropriateness as measurement tools through validity and reliability testing using the SmartPLS application. The validity methods applied in this study included convergent validity, discriminant validity, and Average Variance Extracted (AVE). The research instrument was considered convergently valid when the loading value exceeded 0.7, or when the loading value was below 0.7 but the AVE was greater than 0.5 (Hair et al., 2010).

Table 2. Convergent Validity

	Perceived Economic Impact	Perceived Environmental Impact	Perceived Sociocultural Impact	Resident Support
PE1	0.632	0.821	0.633	0.561
PE3	0.505	0.748	0.622	0.611
PE4	0.596	0.749	0.509	0.519
PE5	0.616	0.822	0.671	0.660
PE6	0.480	0.688	0.516	0.496
PEI1	0.861	0.597	0.587	0.663
PEI2	0.852	0.612	0.660	0.648
PEI3	0.821	0.604	0.640	0.623
PEI4	0.826	0.609	0.515	0.574
PEI5	0.810	0.663	0.571	0.579
PSI1	0.552	0.612	0.777	0.512
PSI2	0.523	0.610	0.811	0.642
PSI3	0.485	0.475	0.694	0.507
PSI4	0.652	0.694	0.825	0.718
RS1	0.487	0.592	0.555	0.735
RS2	0.610	0.548	0.595	0.792
RS3	0.605	0.579	0.610	0.798
RS4	0.496	0.514	0.581	0.719
RS5	0.640	0.652	0.680	0.840
RS6	0.655	0.646	0.648	0.841

Sumber: Data diolah peneliti, 2025

Based on the results of the convergent validity test in Table 2, it was found that all research items met the criteria for convergent validity. This indicates that, at the level of indicator items, the measurement instrument fulfilled the prerequisites required in this study. The next stage was to conduct discriminant validity testing.

Table 3. Results of Discriminant Validity Testing

Variabel	Perceived Economic	Perceived Environmental	Perceived Sociocultural	Resident Support
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	Impact	Impact	Impact	
Perceived Economic Impact	0.834			
Perceived Environmental Impact	0.533	0.738		
Perceived Sociocultural Impact	0.442	0.442	0.789	
Resident Support	0.427	0.589	0.486	0.745

Based on the results of the discriminant validity test, it was found that at the variable level, all constructs met the criteria for discriminant validity. This was demonstrated by values that were higher compared to those of other variables. In other words, each construct was discriminant in nature and could not serve as a measurement indicator for other variables.

Table 4. Reliability Test Results

Variabel	Composite Reliability	Average Variance Extracted (AVE)
Economic Perception	0.919	0.696
Environment Effect	0.877	0.545
Resident Support	0.908	0.622
Sociocultural Perception	0.861	0.555

The next stage of testing was reliability assessment. Based on the results, the composite reliability values were all above 0.7, thereby fulfilling the requirements as valid measurement instruments for this study (Hair et al., 2010).

Table 5. Path Analysis

Variabel	Path Coefficient	P Values	Information
Perceived Economic Impact -> Resident Support	0.295	0.000	Supported
Perceived Environmental Impact -> Resident Support	0.230	0.003	Supported
Perceived Sociocultural Impact -> Resident Support	0.387	0.000	Supported

Based on the results of the path analysis, it was found that all three independent variables had a significant influence on resident support. The variable *Perceived Economic Impact* showed a path coefficient value of 0.295 with a p-value of 0.000, thus supporting the hypothesis. This indicates that the more positive the community's perception of the economic impact of an activity or program, the greater the support they provide. This finding reinforces that economic factors are among the key determinants shaping residents' attitudes toward involvement in or acceptance of a policy.

Furthermore, the *Perceived Environmental Impact* variable also demonstrated a significant effect, with a path coefficient of 0.230 and a p-value of 0.003, indicating that residents' perceptions of environmental impacts play a role in fostering support. In addition, *Perceived Sociocultural Impact* emerged as the most influential factor, with a path coefficient of 0.387 and a p-value of 0.000. This result suggests that the more

favorable residents' perceptions of sociocultural benefits, the stronger the support they extend.

Perceived Economic Impact and Resident Support

The results of the study show that perceptions of economic impact have a significant effect on local community support for sustainable tourism in the Lake Toba area. This finding is consistent with Hsu & Chen (2019), who revealed that the greater the economic benefits perceived by the community, such as increased income and employment, the stronger their support for sustainable tourism development. This condition indicates that communities tend to evaluate tourism based on the direct economic benefits they obtain, for example, in the form of business opportunities and increased local consumption.

Furthermore, research in Tanzania by Ngowi & Jani (2018) found that community satisfaction with tourism is closely linked to perceived economic benefits. This means that although social and environmental factors are important, the economic aspect remains the main driver of community support. This can be explained through the perspective of Social Exchange Theory, in which communities support a policy or program when the benefits they receive outweigh the social or environmental costs incurred. In the context of Lake Toba, strong community support can be interpreted as a reflection of their expectations for improved economic well-being.

Perceived Environmental Impact and Resident Support

The analysis shows that perceptions of environmental impact also significantly affect local community support, although the effect is smaller compared to economic and sociocultural aspects. This finding aligns with Eslami et al. (2019), who emphasized that community attachment to the environment and their perceptions of natural sustainability are strongly related to support for sustainable tourism. When communities perceive that tourism contributes to environmental preservation, their support tends to increase.

Xu & Hu (2021) also add that community participation in environmental management strengthens pro-environmental behavior and supports the sustainability of tourist destinations. In the case of Lake Toba, this can be realized through community involvement in conservation programs, waste management, and pollution control. Therefore, although the contribution of environmental impacts to community support is relatively lower, this factor plays an important role in maintaining the long-term legitimacy of sustainable tourism.

Perceived Sociocultural Impact and Resident Support

Sociocultural impact has been proven to be the most influential factor in shaping local community support. This result is consistent with Uslu et al. (2023), who emphasized that communities perceiving tourism as a means of preserving traditions and promoting local culture provide stronger support. In the context of

Lake Toba, tourism has the potential to strengthen Batak cultural identity through cultural festivals, art, and local crafts, which in turn enhance community pride in their cultural heritage.

Moreover, Buta et al. (2014) found that residents' place attachment can mediate their support for sustainable tourism. In other words, the higher the sociocultural values preserved, the stronger the emotional attachment of residents to their destination. This explains why community support in Lake Toba is more strongly influenced by sociocultural factors than by economic or environmental factors. Thus, cultural preservation is not only an issue of identity but also a long-term tourism development strategy.

However, it should be critically noted that tourism also has the potential to cause cultural commodification, namely the transformation of cultural values into mere commercial products. Zhang et al. (2025) caution that although tourism can support cultural sustainability, if not carefully managed, cultural values may be reduced to attractions that lose their original meaning. Therefore, cultural preservation strategies must adopt a participatory approach, in which local communities maintain control over how their culture is represented in the tourism industry.

CONCLUSION

This study demonstrates that the three main factors—perceived economic, environmental, and sociocultural impacts—significantly influence local community support for sustainable tourism development in the Lake Toba area. These findings reaffirm the relevance of Social Exchange Theory, whereby community support increases when the benefits perceived outweigh the costs incurred.

First, perceived economic impact was proven to have a positive effect on community support, reflecting the importance of job creation, income growth, and business opportunities as primary drivers of community involvement. Second, perceived environmental impact also made a significant contribution, albeit relatively smaller, indicating that community awareness of environmental preservation remains a crucial condition for destination sustainability. Third, perceived sociocultural impact emerged as the most dominant factor, signifying that identity, cultural pride, and the sustainability of local values play a central role in strengthening community support for tourism development.

Overall, the findings reveal that sustainable tourism development strategies in Lake Toba cannot focus solely on economic aspects but must also integrate environmental protection and sociocultural preservation. Community support will be stronger when residents perceive a balanced distribution of benefits across all three dimensions. Thus, the policy implication is the need for a holistic and participatory approach in planning, ensuring that local communities are not only beneficiaries but also key actors in safeguarding the sustainability of tourism in Lake Toba.

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